# The L.B.& S.C.R. Modellers Digest

Issue 5

Summer 2017

A journal of the Brighton Circle, for those modelling the “Brighton” in all scales and gauges.

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# Editorial

Thanks again to all the contributors who have provided articles ranging from gauge 3 to 4mm scale. There is a strong rumour that there is a new 2mm scale project under development which may also generate some future features. New contributors are always welcome as the whole point of the Digest is to celebrate the wide range of modelling of LB&SCR prototypes and the possibilities that exist for pre-grouping modelling.

The Brighton Circle modellers meeting took place at Blatchington in March and provided an opportunity for Brighton modellers to get together. There is a short article by Ian MacCormac and some photos.

Thanks also for all the votes in the British Model Railway awards 2016 poll for the LB&SCR Modellers' Digest in the Website of the Year category. It is very flattering that after 3 editions (at the time that the poll was taken), there were so many votes against such illustrious competition.

Eric Gates

Modelling Steward, The Brighton Circle

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# LB&SCR Modelling in S Scale - Part 1

## By Mike Watts

It all started just over 20 years ago when a jointly-owned and run EM layout was withdrawn from the local exhibition circuit here in Ontario, Canada. I had been modelling mostly Southern using the then-prevalent kits, mostly based on SR Western Section prototypes. My friend had decided to move into Gauge 1 (1:32) live steam and somewhat jokingly suggest I model ‘half-one’ (1:64), that is, S scale. It intrigued me and I had previously formed a friendship with Norman Pattenden of the SW Circle, who was an S Scale Society officer.

I had been born and brought up Mitcham, Surrey and thought that a joint LSW/LBSC line based on Mitcham might be something to work on. Well, the LSWR aspect of it almost died off and much of my S scale focus since then has been LB&SCR. I decided to create a layout for exhibition purposes and so the Wandle Valley Railway was born. It toured the exhibition circuit here in southern Ontario for about 8 years until it was withdrawn and broken up around 2005. It featured in British Railway Modelling September 2000 edition as part of a feature on our local Great British Train Show.

S scale is a ‘modellers scale’ and very little trade support has existed. Alan Gibson, who personally modelled in S scale, supported us with a large range of wheel sets, mostly directed towards LMS prototypes. The new owners of his business still offer limited support and custom scaled etchings are available from several sources, including Bill Bedford.

**Terrier No. 65 *Tooting***

It was my desire to build a Terrier that was instrumental in starting it all. Having had 25 to 30 years experience in kit-building (and kit bashing!), scratch-building *Tooting* presented very few problems. Originally I had intended to model c.1875, so it had to be an A1, not an A1X. As with all my original locomotives, I used P4 wheels, if S scale ones were unavailable, and *Tooting* ran as such for many years. But after 5 years or so I switched to using fine scale 4mm wheels which this and other locomotives now have. Tooting has done many miles, but a few years ago a bit of a hard knock damaged one of its wheels so it moves with a slight wobble. When I can find time in the 'shop', I will re-wheel it.


In addition, I moved my modelling date to c.1883, so *Tooting* and most other locomotives needed Westinghouse pumps, which they now have! Nowadays I have strayed into the 20th century with my modelling efforts but *Tooting* still runs as an A1, even though the prototype suffered an early demise.

**D1 No. 33 *Mitcham***

Of course for a small LBSCR layout I had to have a D1 and logically it had to be no. 33 *Mitcham*. As with no. 65 it has always been a reliable performer and has gone through the changes of wheels and addition of Westinghouse pump. Other than that, its history has been much the same as the others, but without the damaged wheels. It is now my designated ‘motor-train’ locomotive, pushing or pulling a Billinton driving trailer, modelled on the one in the well-known photo of such a train leaving Mitcham for Wimbledon at the turn of the century (the previous one!). As with no. 65, it is doubtful whether no. 33 ever ran on the Wimbledon-West Croydon stretch and in fact no. 65 was an Eastbourne engine for many years.

**E1 No. 99**
***Bordeaux***


Photos copyright Mike Watts

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One has to have an E1 for goods traffic and, as one of my favourite wines is a Bordeaux, no.99 it had to be. Of all my S scale locos this is the good old standby, very reliable, locomotive. All new trackwork is tested with no. 99 initially and it is a sort of personal favourite. If ever there are problems, let's get out no. 99 to see what is the problem. Of course after 20 years of intensive use it is looking a bit scruffy, but then I am sure that in real life E1s were the work horses of the railway. I feel it is quite remarkable that Stroudley designed such a locomotive that could function as originally intended some 90 years later

In the next part (2), I will introduce a few more of my LBSCR S scale locomotives: the Craven/ Stroudley 0-4-2T no. 373, the D3 no. 365 and the E4 no. 464.

# Langstone Pier

## By Peter Smith

My new 0 gauge layout ‘Langstone Pier’ has progressed rather more quickly than I’d planned as I found myself with spare time following the cancellation of a commission. I’ve finished three out of the four scenic boards, which is enough to photograph to give an idea of how the finished layout will look.

The idea behind the layout is that, instead of building the bridge at Langstone on the Hayling branch, a pier was constructed which connected the trains with a ferry and coastal steamers. The inspiration was Queenborough and Port Victoria on the SECR,  but the main thinking behind it was simply to be able to build another 0 gauge terminus to fiddle yard layout 20’ long that wouldn’t look just like Saltdean, and hopefully will stand out from the crowd at exhibitions.

I’ve enjoyed building it because it has challenged me, which is always a good thing, particularly building the pier itself which is in effect an elevated baseboard.  It is all built using stripwood glued together and the finished structure is very strong. Because the underneath of the pier is in full view I thought that I couldn’t hang point motors underneath but in fact the Hoffmann motors I use are quite small and they can barely be seen. The points are changed from the DCC hand held controller, and I switch the frog polarity automatically using Frogjuicers.

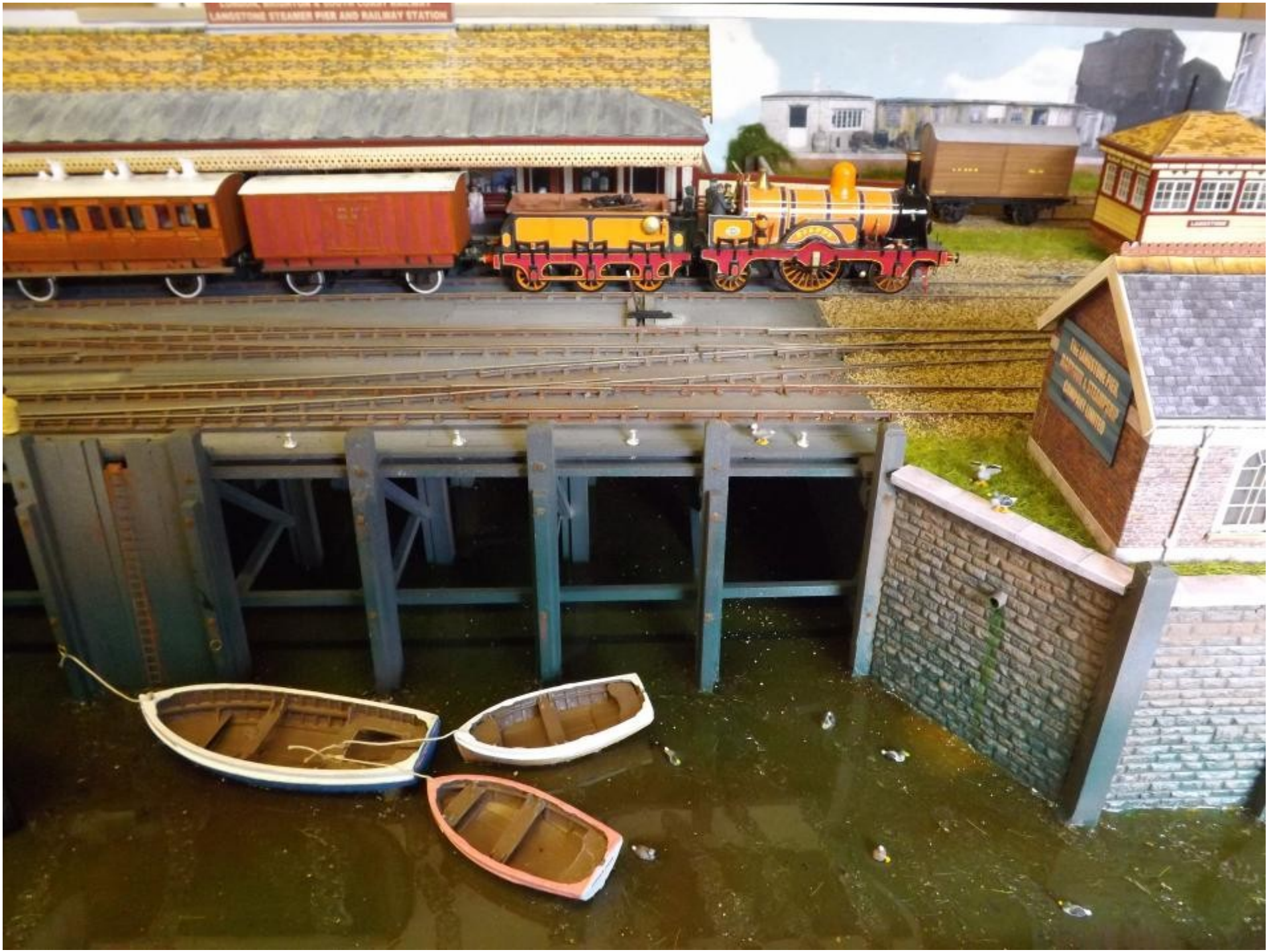
Beyond the pier the layout is pretty conventional; all the track other than the slip is C&L with the points made up from their components...they look much better than Peco, but I know my limitations so a Peco double slip was used, which looks fine once it's painted and ballasted.

The fourth board will have a turntable, so when a passenger train arrives the loco will uncouple and stand at the end of the pier as a new loco runs onto the train and takes it out. The engine that brought the train in will then run back to the turntable for servicing and wait for the next arrival; in that way there are lots of light engine movements and no train goes out with the engine that brought it in. Freight is a bit limited, but along the front will be a line along the top of the stone wall serving a wharf which will be perfect for the Terriers to potter about on. The last board will have some ramshackle warehouses to try to create the sort of scene that Dickens would appreciate. A Jumbo or E1 will bring the freight trains in, and the Terrier will collect the wagons, allowing the larger engine to be turned ready for the next departure. The wharf branch is a bit of homage to Newhaven, though nothing like it scenically. I've made the track rather overgrown as I want to suggest a real railway backwater.

The layout will appear in public for the first time at Huntingdon in February 2018 so I've plenty of time to finish it off. I've got too many engines already but no doubt by then there will be more. It doesn't hurt to have plenty of spares at exhibitions, as I've learned the hard way.


THE LANGSTONE PIER
HARBOUR & STEAMSHIP
COMPANY LIMITED


THE LANGSTONE PIER,
COMPANY LIMITED


LANGSTONE STEAMER PIER AND RAILWAY STATION


PICARDY
S E R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# Oak Hill (or The Brighton on a Budget)

By Gary Kemp

Oak Hill is a 13’ by 2’6”, 00 gauge layout with the fiddle yard set at the rear of one end. It started life as a 1930’s GWR branch line terminus called “Bedruthan Steps”, was built by Falmouth Model Railway Club in the mid-1990’s and was exhibited by them between 1996 and 1999. (If anyone has any pictures of the layout during this time, I would be very interested to see them). Once it was retired, it was sold on to one of the club members, who made some alterations, including changing the layout to a through station. However, the layout ended up in storage in a garage for 12 years and it was after this that the layout came into my possession.

Once the layout was mine, I knew I needed to change it, as I have no interest in modelling the GWR. My previous layout had been completely fictional based nowhere, with a made up company, and I felt that, with this one, it would be nice to try to model something more realistic. As I have always had a

strong interest in local history, there was only really one option for the company to model, therefore I decided that I would use it as the basis for an LB&SCR layout. As I had got the layout for free, I wanted to attempt to do this for as little money as possible, using, as far as possible, what I already had and older R-T-R stock that could be acquired for very little on eBay. This has led to a C2 made from a Tri-ang 3F, a B1 made from a Tri-ang M7 and a static T9 from the Great British Locomotives magazine.

**TRACKWORK**

The track work on the layout is Peco code 100 and all the point work is insulfrog. This is not what I would use if I were to make a layout from scratch, however, I was not willing to rip up all the track and start again with what was basically a ready running layout. I have made very few alterations to the track, with only a couple of sidings extended and a section of the fiddle yard removed and made scenic. The layout has been converted to DCC control and was fully re-wired when I got it, with droppers on every piece of track. I find with DCC that using the fishplates to conduct electricity can cause

issues down the line, as they start to degrade. The points all have H&M motors, which came with the layout and, with a bit of oiling, all still work! These have been wired up with Gaugemaster accessory decoders for DCC control.

**BUILDINGS**

Where possible I have used commercially available kits for the buildings. This includes a Wills engine shed and Wills goods store. Other buildings have been scratch built to keep costs down. These include the station building (based on Hellingly), the stable (a smaller version of the one at Groombridge), the water tower (based on Heathfield), and the coaling stage; this is a freelance design and utilises a Hornby Dublo water crane with small modification to make it look more like a Brighton water crane.


OAK HILL

## ROLLING STOCK

A surprising large amount of the rolling stock on Oak Hill is ready-to-run with very little modification. For example there is a rake of Stroudley 4-wheel carriages which are commercial items from Bachmann USA's Thomas and Friends range (red coach and red brake coach). I have also used cattle vans originally from Mainline which are a close match for LB&SCR vans.

Private owner wagons on the layout are the new Oxford Diecast 4 plank NBR wagons. These are run with just a repaint into Private owner livery.

Some of the other vehicles are old ready-to-run items, modified slightly to make them more representative of LB&SCR stock. Some good examples of this are a Tri-ang brake van and a Tri-ang covered goods wagon, both of which make good representations of Brighton stock. Although the brake van is quite under length, this could easily be sorted with more work.


HALLSHAW

## LOCOMOTIVES

The Locomotives are where I feel my modelling gets “Interesting”. When I first got the layout, to keep the costs down, I imagined the operation being handled by Hornby Terriers, and a Bachmann C class but I realised rapidly that I needed to come up with a low cost method of creating LB&SCR locos.

Cue the entry of my B1 Class, which was made from the chassis, smoke box and front splashers from a Tri-ang M7. These were paired with the boiler, fire box, rear splashers, and tender body from a T9 from the Great British Locomotive series and the tender chassis from a Great British Locomotives Duchess. The rest of the loco is scratch built from plasticard and the transfers were made by me.

I also have a C2 which was made from a Tri-ang 3F. It utilises a replacement dome, safety valves, chimney, and smoke box door, all of which were in my spares box, so I do not know their origins although they look the part. I have also rounded off the bottom of the boiler and scratch built a new cab. The tender has had heavy modification as well. A recent change to the loco was to replace the original wheels with Romfords to allow the loco to run on newer code 75 track work.

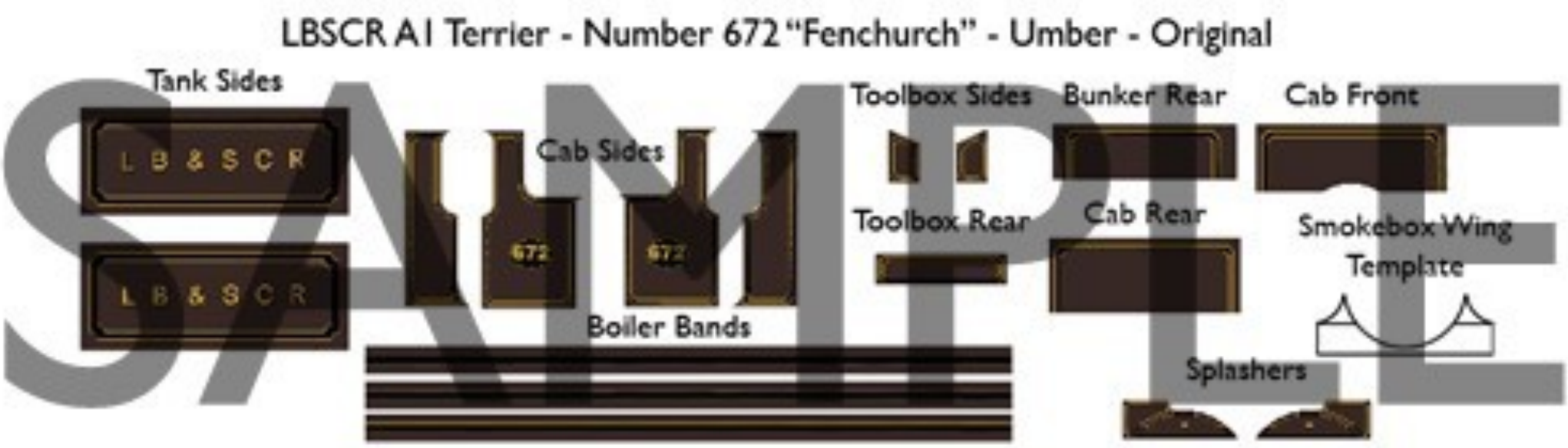

OAK HILL

## PAINTING THE LOCOMOTIVES

As can be seen in the various images, I have made my own transfers for the stock on Oak Hill - this has been something I decided to do to keep costs down. I was inspired by the work of Peter Smith on his Saltdean layout, which can be seen on his “Painting Locomotives without much Paint” thread on RMWeb or in the book that he wrote about the subject.
White transfer paper was purchased, along with a rattle can of Plasti-kote clear sealer.
I then set to work with my laptop to create transfers. The first step was to scan what documents I had, in this case Southern Style 2, which has the appropriate lining for Brighton Stock.

I then set about colour-matching with photos of my stock to ensure that the transfers would print correctly. They have worked out very well, although this doesn't show in the pictures!

Once I had worked out appropriate colours to match my stock, it was just a case of colouring the scans I had taken. This was done with Adobe Fireworks, as this is the software that I have for work. However, the freely available GIMP image editor would be just as good (www.gimp.org). I made a selection of images such as lining corners, lining sides, top and bottom, boiler bands, etc. Cab sides and splashers were made especially for each locomotive.




Once I had these raw materials it was just a case of measuring my locomotives and laying out the components correctly for each one. This was done with Adobe Illustrator, which again is what I use for work, however in this case I cannot suggest an alternative, as I have not used any.

Once I had enough transfers for a full sheet I printed this out first onto plain paper to test sizes and colours and then, once I was happy with this, onto the transfer paper. This was given 2 hours

to let the ink dry properly, then coated with the Plasti-kote to seal it. Once this had dried the transfers were cut to size and applied just like any other water-slide transfer, giving me the ability to have any loco I wanted in any livery I wanted.

The layout, of course, has other stock but most of these are commercial kits and others are not yet in a state for print. I hope you have enjoyed this brief look into my layout and thank you for reading it.

[Oak Hill - LBSCR 1905]

[Hailsham - LBSCR Pre 1914]



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# 4mm scale carriages

## By Nicholas Pryor

I have been a railway modeller since almost as long as I can remember. My first Rovex train set with a crude black 4-6-2 Princess Elizabeth and two short maroon coaches arrived at Christmas 1950. The bug got well into my system and I have been hooked ever since. A series of tail chaser and end to end layouts, entirely based on RTR stock have followed over the years.

Having now racked up nearly 50 years as a member of the Bluebell Railway, it is perhaps entirely unsurprising that my main interest has been for some time now the LBSCR. Building up a fleet of Brighton stock is though particularly difficult when you are someone who after endless lessons and practice, still can't solder anything to anything else in anything approaching a straight line, and couldn't manage a decent paint job to save his life. With patience and much assistance from a course by Tim Shackleton, I have gradually mastered an airbrush and have managed to produce a number of wagons from kits to a fairly decent standard. But both locos and coaches remain well beyond my limited skillset. So I am grateful to the huge talents of Ian Willets as builder and Dave Studley as the great painting supremo for helping me over the last few years to acquire a suitable fleet of Brighton coaches.

The three vehicles illustrated are from the most recent additions to the fleet. These, a D33 Third and a D37 6 wheel First from Roxey kits, and a D47 Full Brake from a London Road Models kit, arrived a few days ago as part of a train of 7 vehicles all in Stroudley varnished mahogany livery. I thought that readers might be interested to see pictures of them. The photos are by Dave

Studley and show them after painting but before interiors were fitted.  The quality of the painted finish is such that at first sight, one would think that the model is made of varnished wood rather than brass.

My collection is defiantly all tension lock coupled, as three link couplings have driven me slowly insane in the past and I have never mastered the Alex Jackson or other similar more discrete

couplings.  So all vehicles are fitted with one or other of the mini versions of the standard Bachmann coupling, which has the advantages of being easy to couple and uncouple (sticks from Mini Magnums make wonderful uncouplers and won't short out the tracks) and robust and reliable.  The vehicles are currently running on Markits die cast wheels, which have excellent

running qualities but look a bit toy like.  These will be swapped out for the Gibson type which I think give a better representation of the originals.

# London - London and Croydon Railway No 5

## By Chris Cox

The London & Croydon Railway ran its first trains in 1839, and typically for railways of that period with no facilities to build its own locomotives, the L & C turned to established engineering companies. Some of them, G & J Rennie for example had reputations forged in other industries but were nevertheless keen to exploit the rapidly growing demand for engines to run on the newly created iron road.

Aside from a later locomotive Coryndon designed by John Chanter and built by Peter Borrie & Co. to research coal burning, the L & C's stable of eight locomotives came from only two manufacturers; the aforementioned G & J Rennie, and the Manchester firm of Sharp & Co. Even at this early stage, Sharps had settled on what could be termed a 'standard' design. A compact and reliable 2-2-2 with a large distinctive brass dome to the front of the boiler and gracefully curved outside frames. A sturdy four wheel tender completed the ensemble, and these diminutive but effective engines provided the first motive power for a good number of railways both at home and abroad.

No.5 was constructed by Sharp & Co. in 1839. Sporting 13" x 18" cylinders and 5' 6" driving wheels it weighed in at 13tons 13cwt, the maker's number was 25. Initially working on the L & C it was included like all its stablemates in the 1842 Joint Committee amalgamation to emerge later as South Eastern Railway No.5 after the dissolution in 1845. Two years later it was overhauled at Deptford (possibly receiving steel cladding to the boiler and improved tender brakes) and sent to

work the Greenwich line. Further postings were made to the Tunbridge Wells branch and finally the Maidstone branch before being condemned and dismantled around 1859.


A simple line drawing of No.5 appears in Bradley's 'Locomotives of the South Eastern Railway' but can only be taken as a representation of the general appearance. Several details are conspicuous by their absence. For the purposes of the model I have referred to a combination of drawings, which I hope are more accurate. The first is a line drawing of SER Vortimer built in 1842, the second is a very detailed drawing of 'La Rapide' built in 1840 for the Paris Versailles. It is this second drawing that has provided the most detail. Although built for a 'foreign' railway, only a year separates it from 'London' and as a relatively standard design I am confident it is the best guide. Other drawings and illustrations have been used in the research, such as a very useful one for Vesuve also built in 1840 and described as; *"…pour le chemin de Versailles et autre lignes."*


Initially my model began life with every intention of being No.13 Vortimer of 1842. However, having constructed the tender drive unit and struggled to find space for both pick-ups and brakes, I admitted defeat and settled for braking on only the right hand side of the tender. Whilst this would not do for Vortimer, which appears to have had brakes on both sides, ‘London’ presented itself as an ideal subject being a few years earlier and braked on only the right. The only changes required to the half built loco would be to discard the steel clad boiler in favour of a timber clad version. Since I intend to model Vortimer in the future the spare boiler will be re-used anyway.

The basis for the model is a set of castings intended to be elevated to the status of ‘kit’ at some point when I can organise an etched chassis *(and not keep getting distracted by shiny objects in the form of other locos and rolling stock projects)*! Therefore there is not a great deal to say regarding the construction of the bulk of the model, perhaps more about the minutiae of details. The tender drive unit is built as a solid power bogie with no means of compensation; essentially a brass box with a motor in it and holes for the axles. This has been an exercise of brute force over ignorance cramming in as large a Mashima motor as possible with worm and pinion drive either end at a 40:1 ratio. I dispensed with the usual solution of fitting Gibson 3’6” tender wheels, as the rims are far too chunky for a vehicle of this age. Instead, 3’6” wagon/carriage wheels were used. This theory was repeated for the leading and trailing axles of the loco as well. The pointed ends of the axles were filed off and the wheelsets fitted in the usual way, running in 2mm axle bearings. Tabs were soldered on to the sides of the structure to carry both wiper pick-ups and part of the brake gear. The unit then fits up inside the tender and is secured with small screws front and rear. Extra whitemetal ballast was shoe-horned in and together with the weight of the tender castings it forms quite a powerful lump. Details added above the footplate include handrails, brake standard and real coke (or rather clinker from the coal fire). I fabricated some sprung buffers for the rear, as due to the curved draw beam there was room to do so and an opportunity not to be missed.

The engine was built up from the castings, which form the two footplates with splashers/outside frames, smokebox, buffer beam and rear footplate. The boiler barrel is from brass tube and the firebox a wrap of sheet brass. The barrel was carefully measured undersize so that it could be clad in mahogany veneer cut into thin strips. These were stuck on one by one over a wrap of strong double-sided sticky tape. The same method was used for the firebox and once complete, a couple of coats of satin varnish secured everything in place. A light sanding with some very fine emery paper finished the carpentry before adding the boiler bands cut from 5thou brass. The dome and safety valve bonnet were turned on the lathe but the chimney is cast whitemetal. All the

sundry boiler fittings were made and fixed in place and the boiler left as a separate sub assembly to be glued in later. I made the decision to fabricate a tallow oiler to the left hand side, as this appears to be a common fitting on many Sharpies. This meant that the nameplate London had to be fitted on the centre ring. Although the line drawing of London shows it to be on the front ring, I am a little suspicious of the accuracy of this location, as it leaves no provision for oiling the motion on the go. La Rapide carries its nameplate on the centre ring to allow for the tallow oiler to sit in its usual place.

The springs were built up from two part castings; a front and back piece laminated together. These were painted and set aside to fit towards the end of the build so they would not get in the way or be damaged. This was particularly important on the tender, which required painting and lining before the springs obscured the bottom sides. Handrails were added to the loco and tender and the

reversing lever was a spare left over from a test etch for a Nasmyth Wilson single *(the subject of another Digest submission)*. The leading axle was assembled with pinpoint bearings glued in place. The rest of the loco was supported straight and level whilst the glue dried and I held my breath. This turned out to be a successful operation although somewhat permanent. The driving and trailing wheels are mounted in a carriage with a central pivot under the firebox; a bogie with unequal wheels. This means the engine rides on three points like a milking stool ensuring all wheels remain in contact with the rails no matter how atrocious my track laying turns out to be.

A basic set of motion was built up using castings from an old Jenny Lind kit and fitted in place. Although only cosmetic it fills the unrealistic gap, which would otherwise be visible under the boiler. Engine and tender were then painted and lined before the fitting the springs, boiler and final details. London's crew are currently being scratchbuilt and will be introduced to their steed before it enters service at Bricklayers Arms.




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# Bishopstone and its bell

## By Richard Barton

Some years ago I used the etchings of the Sharpie GWR1386/WCPR “Hesperous” from Redcraft Engineering as a basis for a 7mm model of “Bishopstone”, as beautifully photographed at Newhaven between 1875 and 1875. There has been correspondence on the LB&SCR Yahoo Group for several years about the method of operation of locomotive bells and in Circular Volume 40 No 4 Geoff Smith provided some close up photographs.

Until last year finding a suitable bell had eluded me until I found a brass GWR Auto Trailer bell on CPL's stand (their reference 237). This seemed to be the correct dimensions and I disposed of the backing plate and constructed a new one based on the photo in 40/4.

I would dearly like to construct a second model of this locomotive after it was renamed “Fratton”, for the Hayling Island service but what modifications might have been made, as there is no known photograph? Obviously Westinghouse brakes would have been fitted and conventional buffers.Would the original cab have been retained with the sides enclosed like “Bognor” or would Stroudley have constructed a new cab of his own design, as he did with “Hayling Island” itself? Expert opinion (guess!) would be very welcome!


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# A Gauge 3 Horsebox

By Jon Nazareth

Here's the latest of my G3 models. The body and under frame are made from plasticard, the roof from scored aluminium sheet covered with artist's watercolour paper. The only items bought in were the wheels and the draw hooks with the rest being scratchbuilt. The lamp top I made and then sent off to Australia for casting in whitemetal. I ordered more than I needed, allowing for future models and some for other modellers of G3. The springs were laminated up from nickel strip as one-offs and the buffers turned up from steel and brass. The window glass is just that, glass cut from microscope glass, those in the horse compartment being 'frosted' by rubbing on an oil stone. There isn't any lettering as yet, as G3 is not a common scale. I was going to send it off to be lettered but didn't want to take the risk of having it damaged or the lettering not coming out just as I wanted it.



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# Short Trains - postscript to Part 2

## By Nick Holliday

Bob Sankey, known as Northroader on RMweb, has scratch built a number of Craven locos in Stroudley guise, in 7mm, and, with a small selection of Craven and Stroudley coaches, they are seen on his Washbourne layout, which features in RMweb. The coaches are a Stroudley D47 brake van from a Roxey Mouldings kit, a Stroudley D41 composite, built using AnD bodysides, a plastic sheet based scratch builder's aid, and a totally scratch-built Craven 15J brake third.


2-2-2 tank – No 214 Seaford


2-4-0 saddle tank – No 365 Lewes

For those of you tempted by O Gauge, but who are short of space, the whole scene measures just 36” in overall length!

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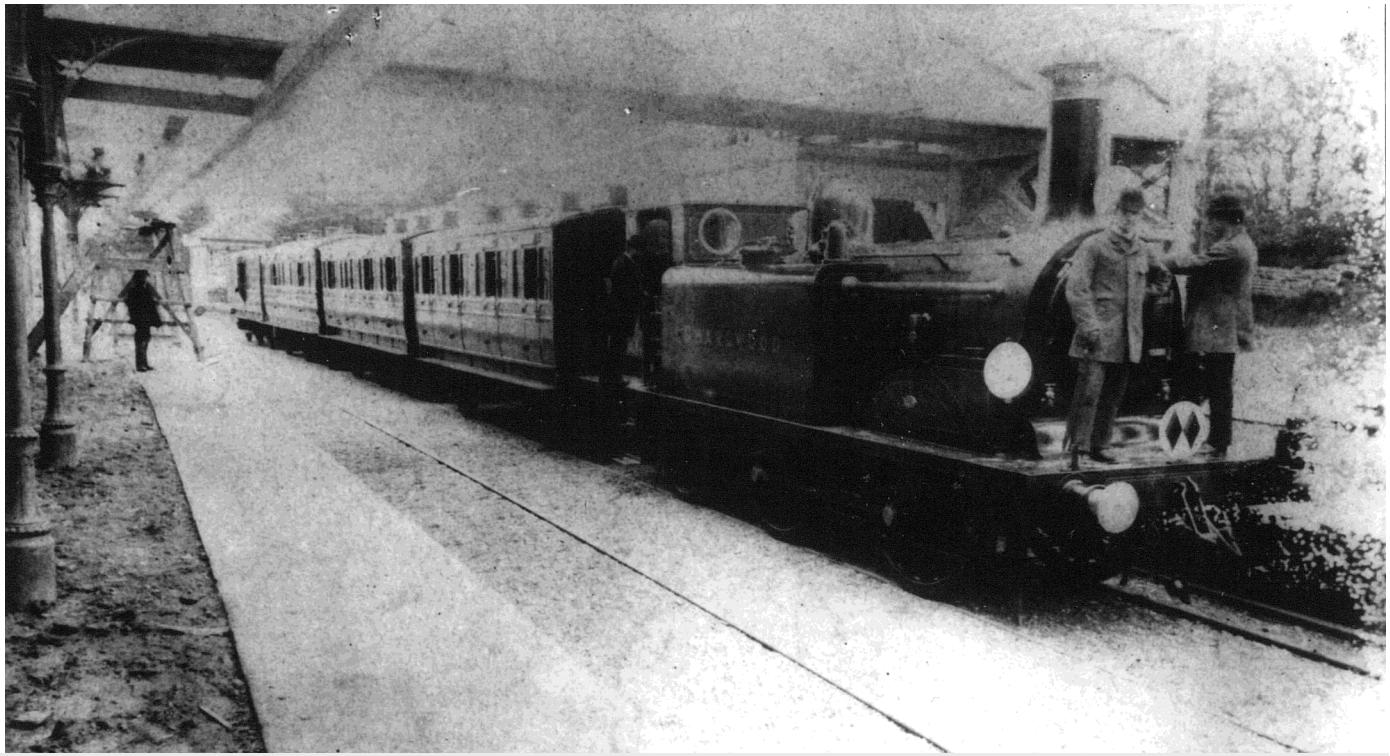
# Short Trains - Part 3

## By Nick Holliday

As Victoria's reign came to a close, the railways of Britain were beginning to feel the pinch. Fuel and other material costs were rising, labour costs were soaring as the effect of shorter working weeks and higher wages began to be felt, and across the country, the advent of trams, particularly electric ones, were starting to steal traffic from the railways, which could not compete with their frequency of service and convenience. On some sections of the Brighton system, business continued to be good, and the length of passenger trains generally reflected these levels, although on the less remunerative lines, such as to Hayling, three or four four-wheeled coaches continued to suffice.



D1 0-4-2 tank with early train (c 1882) on the East Grinstead to Lewes line (The Bluebell Railway)

Around 1905 the Brighton board turned their thoughts to addressing these problems, and with greater perspicacity than most other railway companies, actually took steps to trial the various options available to them. To address the falling traffic on the commuter lines, they took the bold step of carrying out electrification, initially only on the South London Line, using a high voltage AC overhead system. The scale of this is beyond this brief study, but subsequent developments will be touched on later. (See bibliography)

At the other end of the investment scale, Robert Billinton, the chief mechanical engineer, prepared a report to consider the various alternatives that might be adopted. Unfortunately, Billinton died before the exercise was concluded, and Marsh, the newly arrived CME, was tasked with investigating cheaper alternatives that would offer operational savings and improve service potential. There were three proposals – self-contained steam railmotors – petrol railmotors – pull-push trains, using redundant steam locos with purpose-built trailers – and two of each type were procured for evaluation. All three proposals were relatively untried, and hence a degree of experimentation was involved with all of them.

**Steam Railmotors**

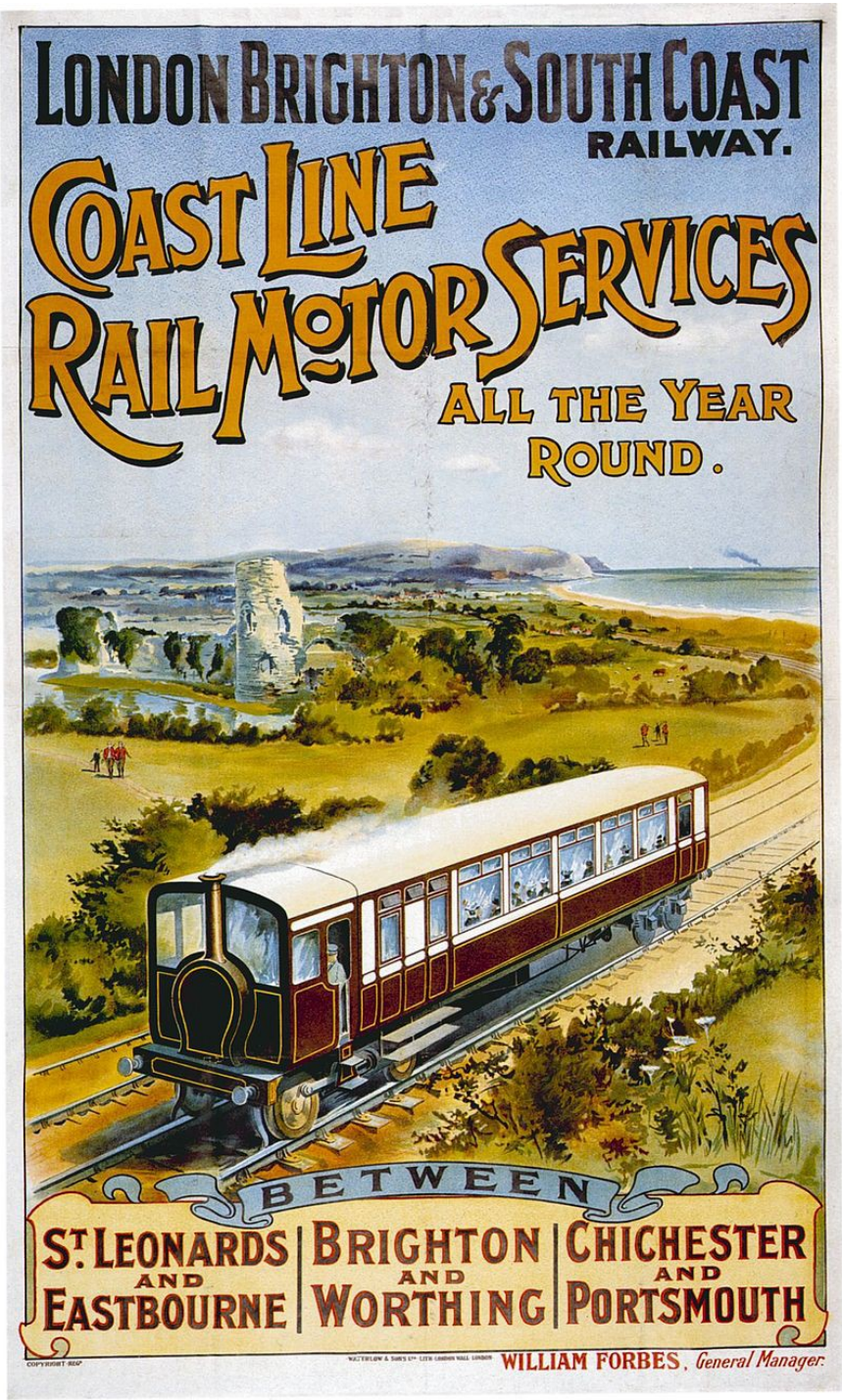
The LBSCR was already involved, to a degree, with the first of the twentieth century steam railmotors, being partners in the Southsea Railway, for which Dugald Drummond, a Brighton Works alumni, designed a pair of self-contained machines, with, initially, a small vertical boiler loco and a passenger saloon combined on one underframe. Initially this seemed successful, and was even demonstrated to the GWR, who liked the concept so much they developed their extensive fleet of steam railmotors, but wisely designed a far more powerful and robust machine.

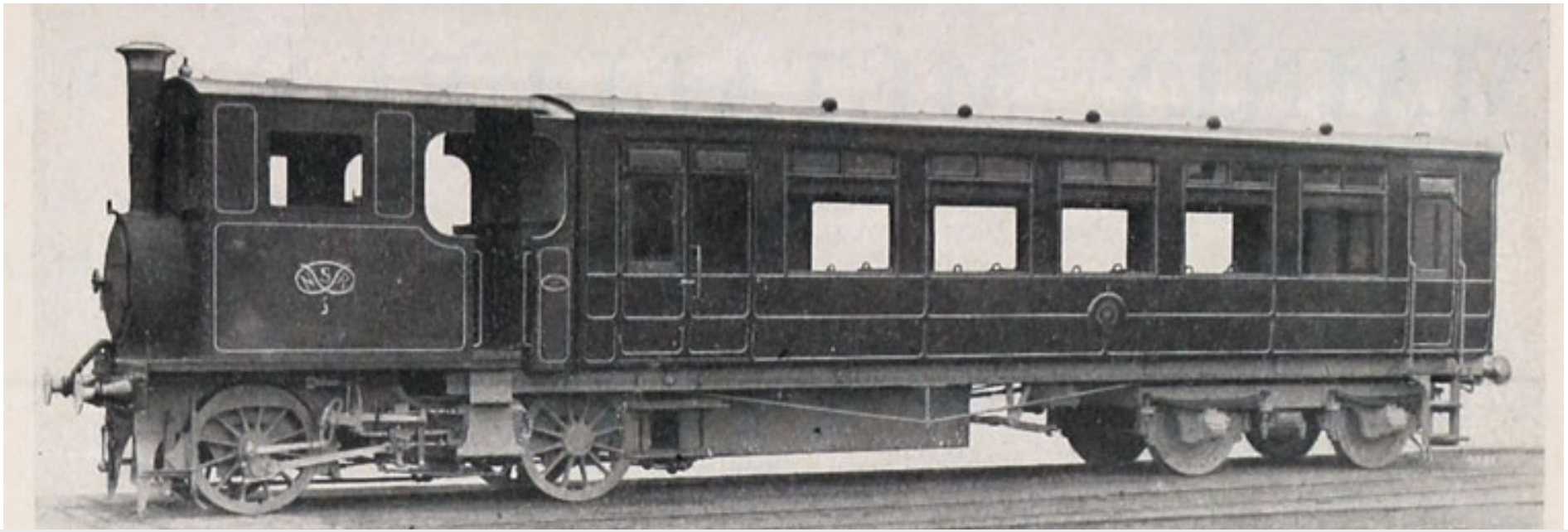

In service from Fratton, the Drummond units proved less useful, although they staggered on for a few years, rebuilt with small horizontal boilers. Models are few and far between, although a 7mm brass kit was available briefly.

LSWR/LBSCR Joint Steam Railmotor No. 1 at Fratton, in as-built condition, with small vertical boiler

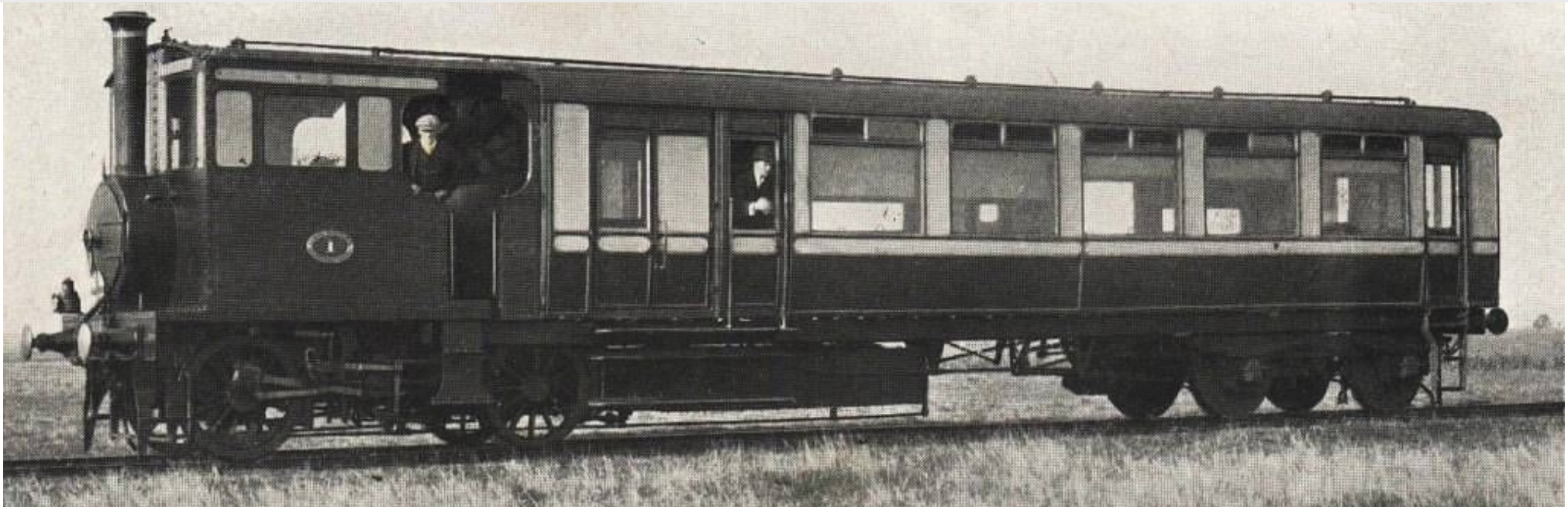
For their own use, the LBSC turned to a more reliable source, and purchased what was almost an off-the-peg model from Beyer Peacock, with the loco design being shared with the North Staffordshire Railway, although the passenger section was a bit more in the Brighton style. Despite the ancestry, these units were not successful, running along the east coast lines for a few years before the Great War saw them put into storage. However, the Brighton was very proud of their new acquisition, and it featured in a familiar poster, although the artist has not quite captured the locomotive part correctly!

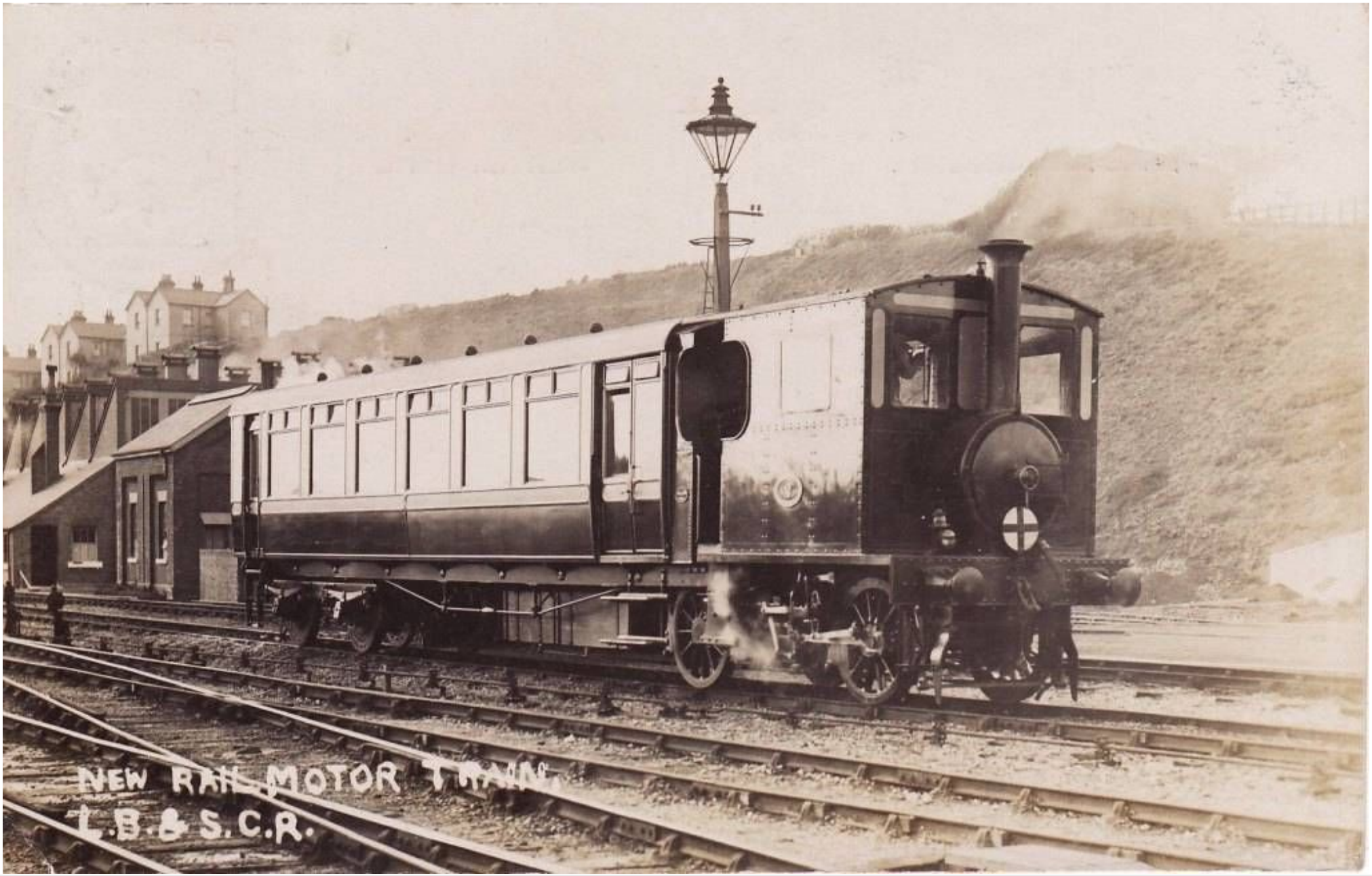
Again, models are very scarce, and the only help available currently is a body-only etching from Worsley Works for the North Staffordshire version, which would need the passenger section to be scratch-built, although there are rumours of a Brighton version in the pipeline.





Above - the North Staffordshire Railway's version. The locomotive portion is virtually identical to the LBSCR type, although the passenger section is very different. LB&SCR No 1 shown below.



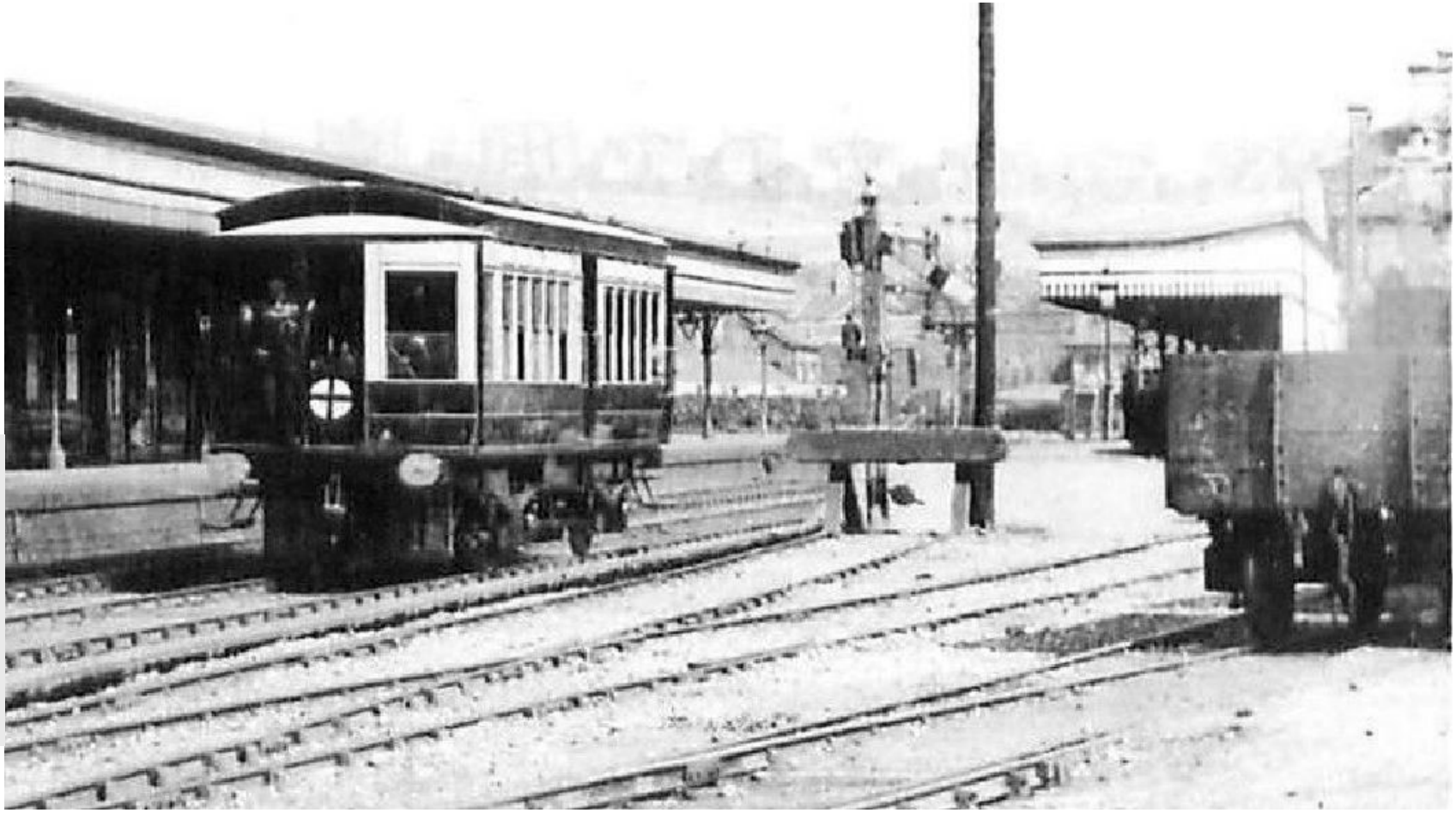



LBSCR Steam Railmotor No. 2, showing the slightly different arrangement of windows and guard’s compartment.

Photo taken at Dennis Tilman’s Brighton Day. Model of railmotor No. 1 is scratch built by Peter Wisdom in 7mm scale, painted by Colin Hayward and is in the Bluebell Museum at Sheffield Park

**Petrol railmotors**

The new CME, Douglas Earl Marsh, arrived from the Great Northern Railway works at Doncaster, where there was a small petrol driven railmotor, built by the tram manufacturers, Dick, Kerr, being evaluated. A pair of larger units, still four wheeled, were purchased from Dick, Kerr, and, for some reason, although both were mechanically similar, their bodies were of differing styles, making each look very distinctive, at least when first built. Unfortunately, in operation, they proved unreliable and under-powered, and despite the constant attention of Daimler engineers trying to resolve the many issues, they did not last long in public service on the east coast line either.



Petrol railmotor No.3, in early condition showing the open-ended platform.

Ultimately both were converted to service vehicles for the overhead electrified system, and managed to survive to assist in the removal of the equipment in 1929, so the concept wasn't entirely flawed.


Petrol railmotor No.3, in early condition but after enclosure of open end platforms.


Petrol railmotor No.4, in early condition but after enclosure of open end platforms.

Models of these railmotors are extremely rare. Peter Wisdom has constructed one in 7mm from scratch, as described in Digest No. 2, which has required extensive research to establish the details of these vehicles. There are currently no offerings on any scale to assist the modeller.

Peter Wisdom’s 7mm model of petrol railmotor No 4.

**Further reading**

Steam and petrol railmotors

Very little has been published on the LBSCR railmotors. The most detailed is within the RCTS series by D L Bradley, Locomotives of the LBSCR – Volume 3. There are some good photos of both types in David Jenkinson's British Railcars 1900 to 1950, from Atlantic Transport Publications, but the written information is largely unreliable. There is a drawing and dimensions for the steam railmotors in R W Rush's book British Steam Railcars published by Oakwood Press. Original drawings for both steam railmotors and petrol railmotor No 3 are available from HMRS Drawing Service, and can be inspected on line.

The Joint Railway steam railcars are comprehensively covered in Gordon Weddell's volume on LSWR Carriages of the 20th Century from OPC. A series of views of these units under construction can be seen in both The LSWR at Nine Elms - The Works and Its Products 1839-1909 by Barry Curl from Kestrel Books, and Wild Swan's "luxury" version of Bradley's LSWR Locomotives – Drummond Classes

HMRS Drawing Service
http://www.hmrs.org.uk/drawings/british.php?formbutton1=search+British+companies

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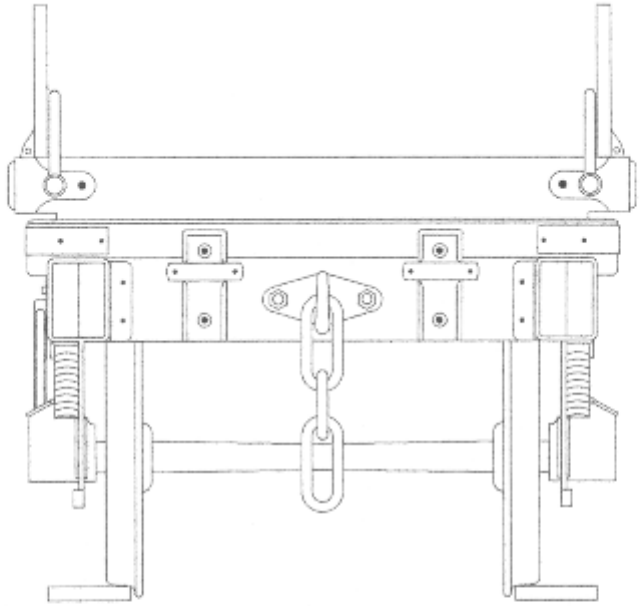
# Wagon Drawing - a timber Bolster

## By Simon Turner

Given the heavily wooded area of the Weald, timber was an important source of traffic for the L.B.& S.C.R.. Timber bolsters were therefore not uncommon on the Brighton system.

This drawing illustrates a typical dumb buffered, single bolster and vehicles of this kind would have been used in pairs, triplets or more to carry long loads.

Dumb buffers would have disappeared on revenue vehicles by 1914, although some ballast wagons, which would not have strayed off the system, survived into Southern days.

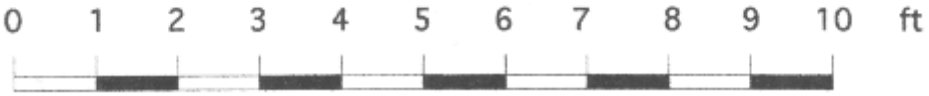


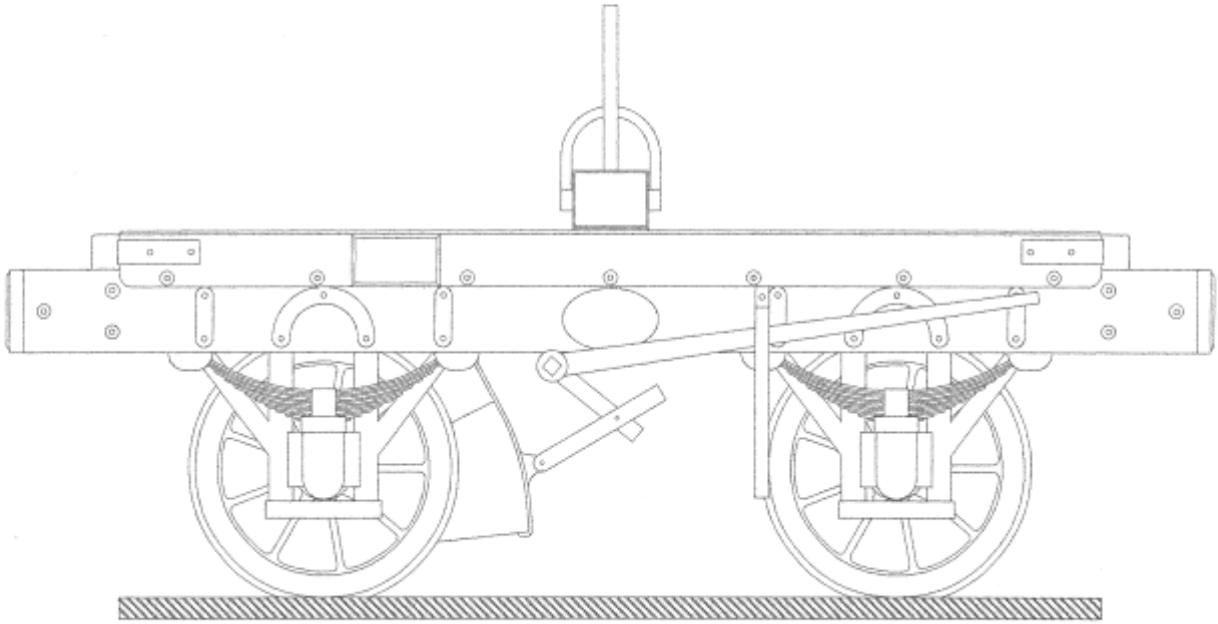
End View

LB&SCR Timber Truck

Dwg.No.2451 of 1874

Redrawn by S.Turner *Mar 1999*

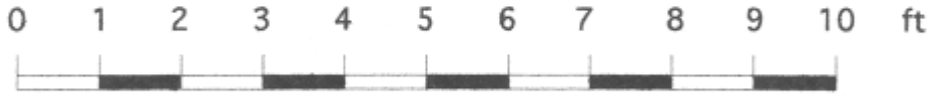




# LB&SCR Timber Truck

## Dwg.No.2451 of 1874

Redrawn by S.Turner *Mar 1999*

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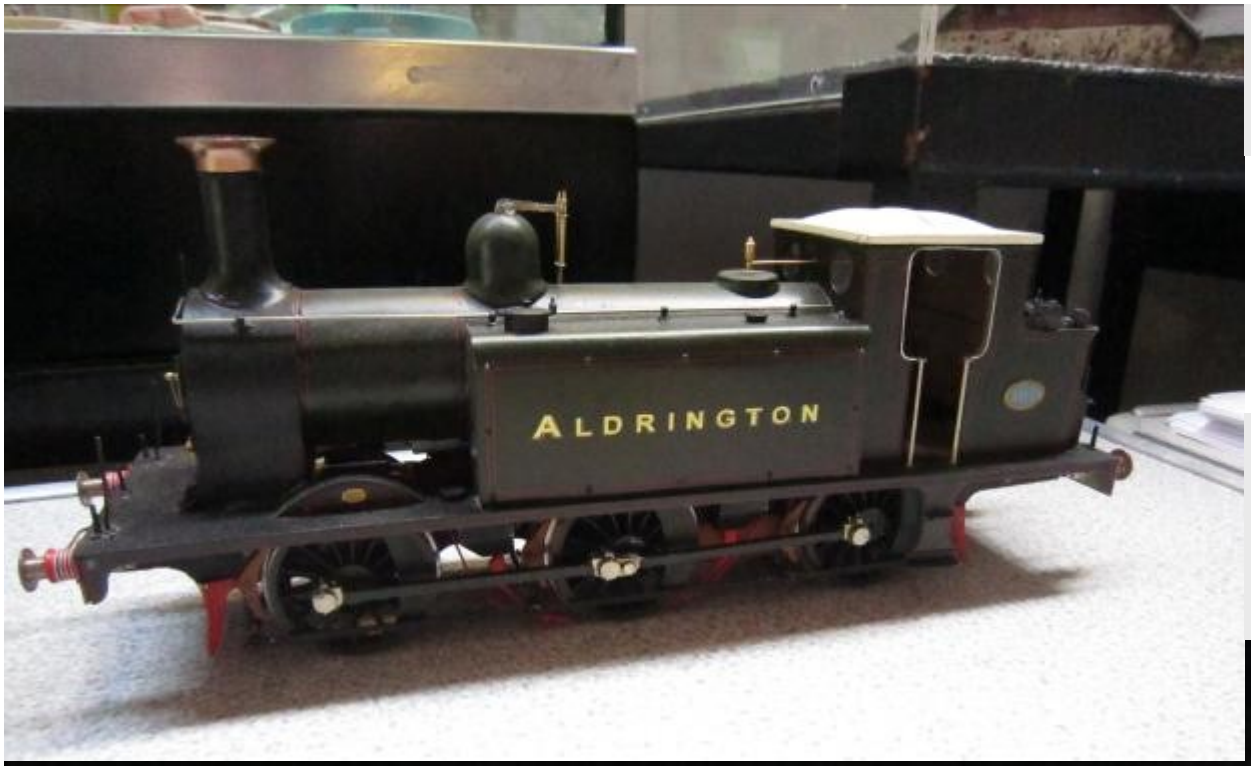
# Blatchington Mill meeting

## By Ian MacCormac

The annual modellers meeting took place on 18th March at Blatchingon Windmill. A number of members brought along items for display, of which a couple are illustrated.

The morning was spent discussing a range of modelling topics followed by a lunch interval, with an excellent meal provided by Peter Wisdom and his wife Dulcie. In the afternoon there was a look at photographs from Laurie Marshall, mainly locomotives in alphabetical order A to L.


Peter Wisdom's 7mm scale West Brighton




Peter Wisdom’s 7mm scale E tank of the Billinton batch.

Eddie Carter’s scratchbuilt 4mm scale D tank and Smallbrook Studio Stroudley carriages.

A trio of NPCS vehicles in 7mm scale by Peter Wisdom



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# Craven Brake 2nd 9C in 7mm scale

## By Richard Barton

In Digest No 4 there were illustrations of five delightful early coaches built by Peter Wisdom. My modelling is also “going back in time” for reasons of space; the advantages aptly explained by Dan Garrett on his SER Kits website. There is also less chance of Bachmann or Dapol bringing out a RTR version!

Some years ago I built a Craven First in 7mm from Ian MacCormac's etches, which was painted in teak. To complement this I scratch built a Passenger Brake Van Type 20B and a Third Type 8B. When Ian announced etches for a Brake Second 9C this was acquired immediately to complete a four coach rake.

The parts for the body and chassis were crisply etched: my only reservation on the body was the need to scribe the doors, which were not etched. This was easy with the aid of a set square and before assembling the sides but I avoided scribing too deeply, as the brass began to distort. When spraying with Precision's mahogany I had problems with my airbrush and needed three coats to obtain a satisfactory finish but this covered most of my carefully scribed doors! A narrow brass angle was soldered to the base of the sides, which gives more rigidity than the etch supplied but this restricts access to the interior once the roof is fixed. It is best to fit only the central partition at this stage and the outer partitions after the final assembly, once the glazing is in place. Ian White confirmed that the partitions would have been full height but, as there is only one oil pot, the partition between the two compartments would have a semi circular cut out at the top. The glazing for the lantern roof was measured and cut to shape before the roof was fixed.

The etched solebars overlays are oversize and need to be trimmed to size to fit but, more time consuming to correct, the footboard supports etched on the solebars didn't match the door positions. The supports had to be carefully filed off and replaced with Evergreen plastic strips below each door. The bolt heads etched on the solebars are round but the drawing shows them to have been square. I am not a fan of springing, preferring compensation, but on a trial run the coach ran smoothly through all pointwork.

Ian MacCormac recommends castings from SER Kits. The SER 1850s or 1860s axleboxes can be used- I had the latter to hand and had to cut away most of the square backing plate for attachment to the springing unit- but only after final assembly.

It is best to remove the springing units when painting the chassis and, once the axleboxes are attached, that is no longer possible. Ian MacCormac's method was to mill out a vertical slot in the axleboxes. This allows them to be fixed to the W Irons with the wheel bearings in the springing units free to move up and down in the slots.

For this solution the 1860s axleboxes are best, as they are “meatier”. The only other chassis modification was to replace the etched lower footboards with 5mm x 1mm unequal brass angle.

Referring to the drawing in Volume 1 of LB&SCR coaches the later cast 4 rib buffer stocks seemed to be more suitable than the earlier ribbed ones and “Early LSWR/Metro Cam” castings from ABS (ref 0.960) were used, together with Roxey's Stroudley buffer heads. The oil pots and stands were lovely lost wax castings from Laurie Griffin.

The drawing of 9C shows small lettering in the waist panels and in the absence of more information I used the Stroudley period transfers from Eric Gates. There are no suitable transfers for “Passenger Luggage”, which will have to be hand lettered in the future. When repainted in mahogany it is likely that the coach would have been fully lined. Precision mahogany is only available in “dull” and I prefer to apply gloss varnish to the coach sides prior to lining (it is difficult to correct errors on a matt or semi-matt surface), followed by a final coat of satin varnish. Two coats of varnish would have covered up still more of the scribed doors and so lining was omitted.

## CONCLUSIONS

Not withstanding some of the above comments it was a pleasure to build and I am very pleased with the resulting coach. Ian will be producing further early coaches and hopefully this will encourage more modelling of the Victorian era.


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# Wagon Turntables for Bricklayers Arms, Part 1

By Chris Cox – 5&9Models

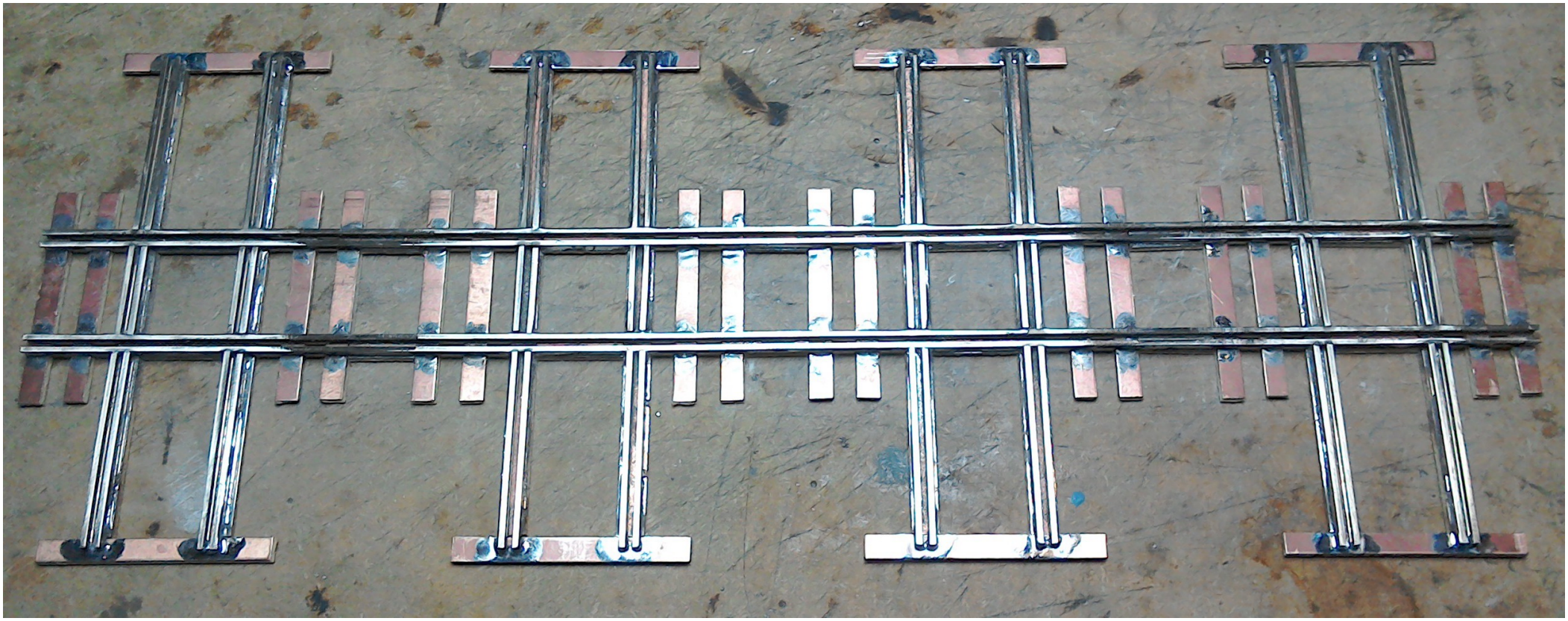
The buildings at Bricklayers Arms were designed by Lewis Cubitt and opened for business in May 1844. The massive goods shed was described in the 'Illustrated Guide to the London & Dover Railway' thus: *'…six spacious warehouses, nearly 400 feet in their whole length, and 60 in width, with a noble roof of open carpentry, with turn-tables, raised platforms, and gateways to each front of the buildings, to admit of town wagons depositing or receiving produce or merchandise, to or from the Railway. The London Carriers have them ready to their hands, supplied with cranes, paved surfaces, and gas-lights, fully adapted to the heavy trade in which they are engaged during our midnight slumbers'.*

This article is intended to provide a small starting point for the project of reconstructing the goods sheds in 4mm scale.

For Part 1 of this article I have chosen to start with a cassette of four dummy turntables to gain a little confidence before tackling the working ones, which will be covered by Part 2 in a future edition of the Digest. For the goods shed there are 25 turntables required, six within the building and the rest without. The following description outlines the process involved to complete this set before moving on to the next, and the next, and the next…!

Firstly, two long rails were laid down, soldered to PCB sleepers at the ends with a few intermediate ones to keep everything straight. A second set of inner check-rails were also included. Longer PCB sleepers were soldered transversely in the correct position for the four

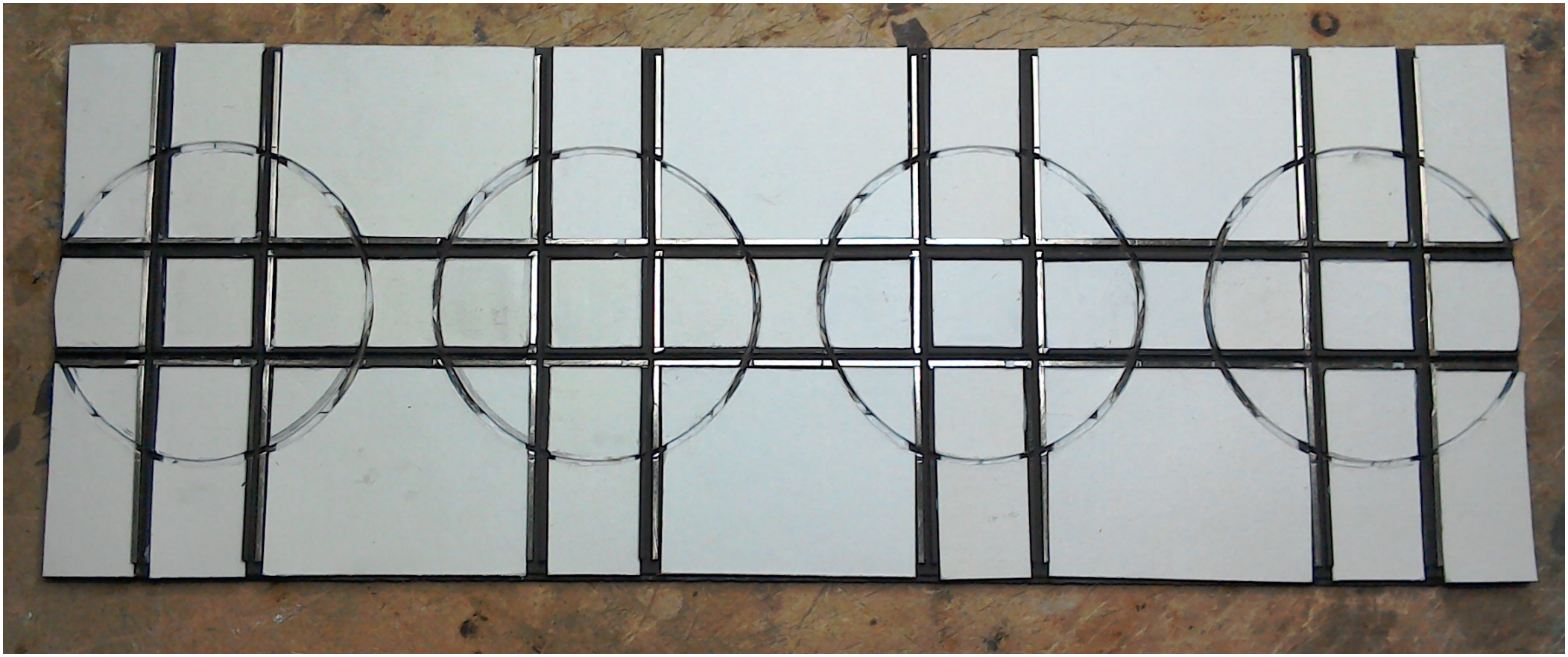
turntables. These will eventually connect to the four lines running parallel to the building. The long rails (and the completed cassette) will sit at right angles to the building, one turntable inside and three outside. Double rails were soldered to the long PCB sleepers and single sleepers were soldered to the ends to provide an anchor point for the other lines as well as electrical connection.



Slots were then cut into the rails using a slitting disc to separate the double rails where they cross on the turntables and to provide electrical insulation and half cuts were made in the transverse rails to indicate the edge of the table rails but maintain electrical contact. The slots to indicate the edge of the tables were not cut in the long rails at this stage as these would need to go right through the rail and top surface of the PCB sleepers for isolation. These would make the structure

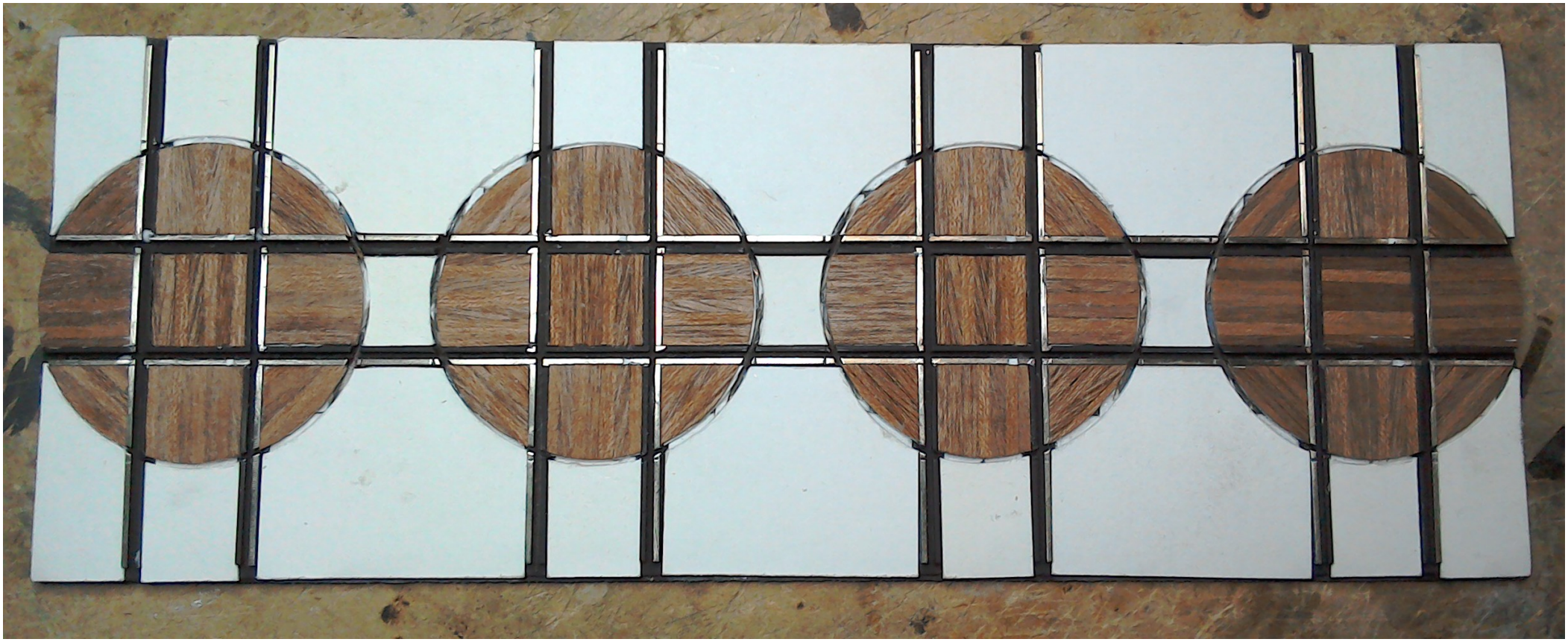
too week so they were done after gluing everything to a stout card baseplate. Other cuts were made to isolate left and right hand rails. The assembly was then washed thoroughly in Acidip to remove all flux residue and dirt before receiving a coat of etch primer and matt brown. Note: Halfords do a very handy can of matt brown camouflage spray paint, perfect for overall rail colour.

Once glued to a base plate as described the electrical circuits were tested, then the surrounds were filled in with carefully cut pieces of card to provide a flat base for timber and setts.



The next stage was the most enjoyable. 2mm wide strips were cut from 0.5mm hardwood veneer.

The sheet was cut in half and the strips taken from either side of the two pieces to provide a bit of variety in tone and grain. Discs of card were cut the correct size for the turntables and pressed onto the rails. The pieces of turntable were then cut from the card following the impressions made by the rails and each piece numbered to match numbers written on each segment of the turntable base. The veneer strips were then glued in place on the card with wood glue, cut round and sanded before being fitted in their numbered positions. Drawings of period wagon turntables published in Railway Machinery by D. K. Clark were followed to establish the correct number of planks and their orientation.



Polyfilla was then applied to the remaining areas, smoothed level and allowed to dry. It was left off the end table as this will be the furthest from the goods shed and although intersected by a few turntables, it forms more of a passing loop and will therefore be ballasted. Stone slab surrounds and setts were scribed into the filler using the fine tapered end of a compass. The point was removed and held in a pin chuck to make things easier but the important aspect was the gradual taper: (too shallow and the risk of breaking away bits of filler adjacent to the working are high).

The stones around the turntables received a coat of Humbrol Matt 121 and the setts Matt 140. A dirty thinned wash of the 140 and Matt 98 was used to pick out the detail and a final slight dry brushing of a pale brown was used to highlight the general appearance. Finally, fine buff ballast was applied and the rails cleaned. A little brown will be reapplied to the rail tops of the unworn check-rails and to disguise the filled insulation breaks in the rail.

Each turntable requires 24 pieces of rail and 55 pieces of timber as well as lots of bits of card.

There are 25 turntables required for the goods shed, a total of 600 pieces of rail and 1375 strips of timber. Some of the turntables will need to be operational and I hope to be able to cover this is a second part to this story.

The final image shows an early Birmingham & Gloucester short wheelbase goods wagon designed specifically with hand shunting and wagon turntables in mind! By design, or perhaps just coincidence, both wheelsets are cradled in the slight dip between the rail and check rail which holds the wagon in the perfect position as the table is turned.



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# Travelling Hand Crane No.19 Part 4

# Crane Body Construction

By Colin Paul

Having spent many hours constructing the underframe for the crane (Part 3), it was time to move on to the moving crane body. As mentioned in Part 2, I collaborated with Francis Leach of www.3d-companions.com to produce a working 3d model for me of the main crane body including the sideframes, end and front views, gearwheels, pinions, and weight box etc, based on the NRM schematic drawing. Over a good month we came up with the final drawing. By no means is it 100% correct but very close to the actual crane (many thanks Francis). As a bonus of him coming from an engineering background, Francis was able to work out the diameter of the gearwheels etc by counting the number of individual teeth of each wheel from the photo of No.19, which helped enormously. In the downloaded software (edrawings 2015 x64 bit edition), the crane could be moved in any direction I wanted, zoomed in or out, rotated, cut and sliced etc. Francis also included all of the working templates with relevant measurements of each component, which was invaluable in constructing the model as accurately as possible. I studied everything very carefully on screen to familiarise myself with all of the individual parts. A number of photocopies of the crane were then printed off exactly to 7mm-1ft in all plains and cardboard mock-ups made. It still took me a few weeks to finally work out how actually to build it and in what order. Lastly, Francis kindly 3d printed all of the black items for the crane as well as the tapered brass central support

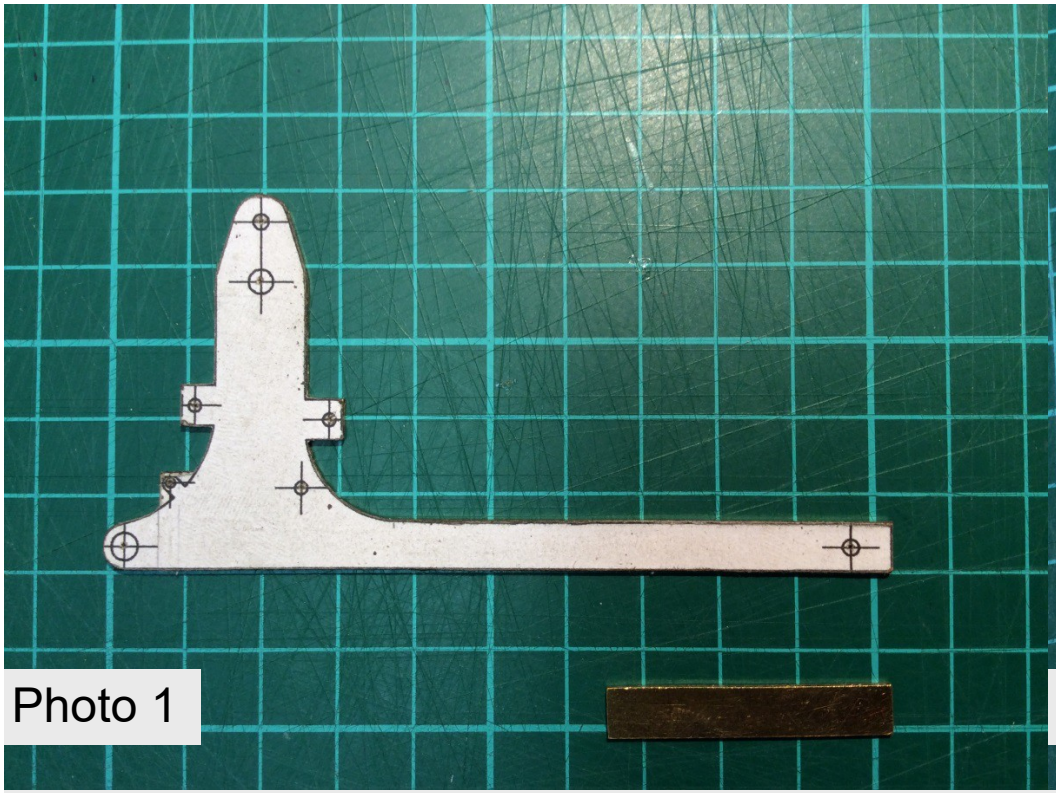


Photo 1

Photo 2

A pair of side frames cut out as one from two sheets of 18thou brass, soldered together with the paper template still glued on. Extreme care was taken **not** to cut and file inside the black line. All of the centre crosses have been pre drilled out already with 0.7mm pilot holes for the axles, pinions and gusset plates. The rear view shows them more clearly. Also shown are a pair of end pieces also cut in pairs, but only one will be used. Some of the holes (not all) will eventually be opened up to accept 1/16$^{th}$ brass axles tubing. The size of the jib hole is yet to be determined. On the drawing it is quite large at 3mm in diameter. Before the pieces were unsoldered and cleaned up, I was going to drill out the relevant holes on the upright sections for the vertical and parallel rivets and bolts, but was not precisely sure where they would be finally positioned. They were eventually drilled out further in the build.

column (as seen previously), whereas, the opaque 3d prints are Shapeways products which were all produced from his drawings.

The first logical items to make were the two sideframes. Thinking 10thou brass would be too flimsy, I plumped for 18thou in the end (Eileen`s Emporium SBA018B). The same thickness of brass was then used throughout the build unless otherwise stated. Two oversize rectangle pieces were cut (11cm x 5.5cm) and soldered together. A body side drawing was then glued straight onto it. Before it was cut out, the largest (top most) gearwheel position had a pilot hole drilled out with 0.7mm drill bit. A 0.7mm n/s rod was then inserted into the hole and the largest 3d printed gearwheel placed over it. To make sure the smaller gearwheel (via a pinion) lined up perfectly, a pinion was then offered up to it meshing the teeth. Marking its centre, another pilot hole was then drilled out. The hole lined up perfectly with the + position on the print. The same was then done with the remaining smaller gearwheel (far side) which also had a pinion above it. At least I knew that when it was time to fit the gearwheels, they would all mesh perfectly. Lastly, holes were drilled out for the gusset plates and jib position (3 in all). Not on the drawing but clearly on the photo of No.19, there are a number of rivets of various sizes (minimum of 9 on each side) on the crane sides. I can just make out two medium sized vertical ones (on the centre line) behind the gearwheel, four small horizontal ones midway down, and three very large ones just above the raised footboard. Later in the build, 0.7mm, 1.0mm, and 1.5mm holes were drilled out ready for these. Only now could the sideframes be cut out as one, using No.0 piercing saw blade and many patient hours filling. Once done, the two frames could be parted and cleaned up.

The overall width of the crane is 33mm (over wrap round strip), so an end plate was cut first to 33mm x 7mm, followed by the base plate measuring 33mm x 97mm. Finally a central support column bearing plate at 30.5mm square was also cut out ready. Centre and lateral lines were then scribed on both as a guide for alignment. The bearing plate then had a round 21mm diameter hole cut into it for the support column to pass through. Care was taken with this hole as it needed

to be a tight fit and not loose around the base of the column. With the aid of the centre lines and double checking with the drawing, the bearing plate was offered up onto the base plate and soldered in place. Using the original hole as a guide in the bearing plate, another hole was then cut out of the base plate. Again this hole had to be tight, so care was taken when filing it close to the original opening. Before going further with the build, the base plate was mounted on the decking of the underframe and tested for binding and clearance by rotating it on the central support column .

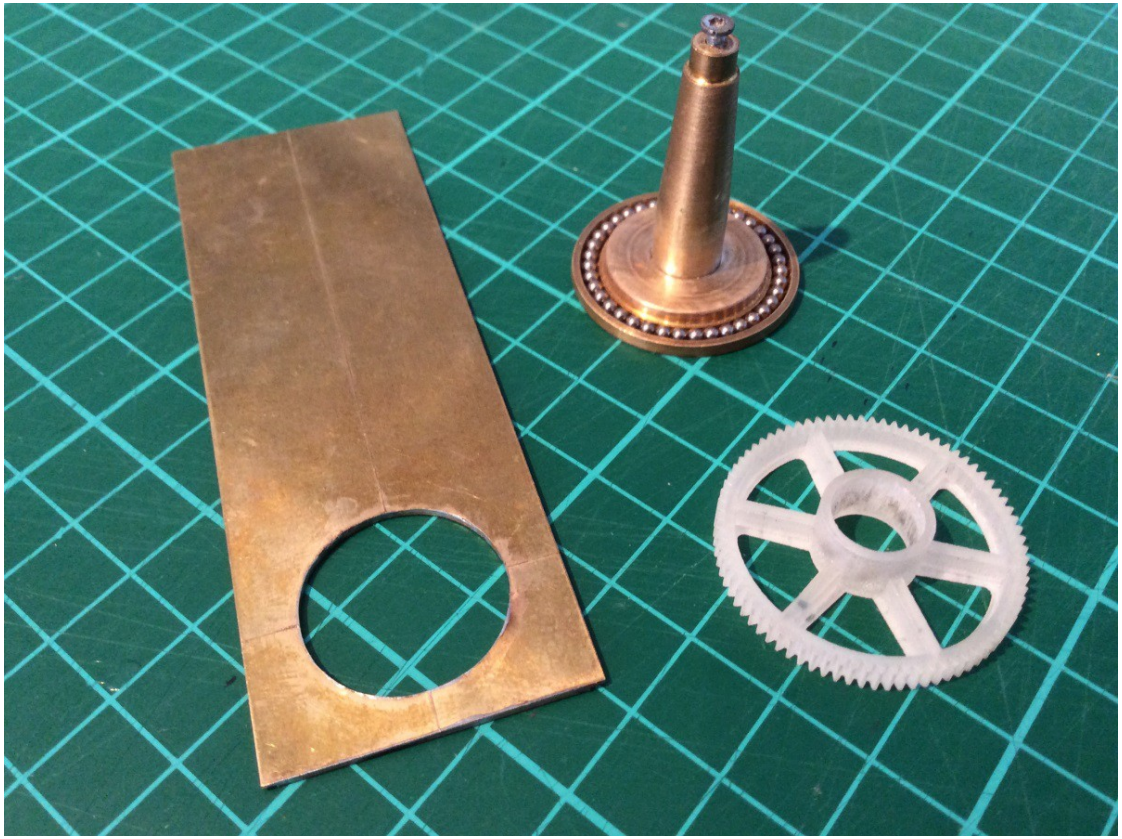


Photo 3

The completed base plate (top side) clearly showing both scribed lines. A circle was scribed on and extreme care was taken in cutting it out. It had to be a tight snug fit for the column to rotate in. For ease of rotation of the crane body, the groove of the central support columns base plate will eventually have 39, 2mm diameter stainless steel ball bearings inserted as shown. The balls rotate on the underside of the square bearing plate (not shown). The large geared slewing ring which passes over the tapered column is a Shapways 3d print and will eventually be retained with a pin. The nearly completed crane body has been tested without the ball bearings in place and still rotates with ease so they may not be used.

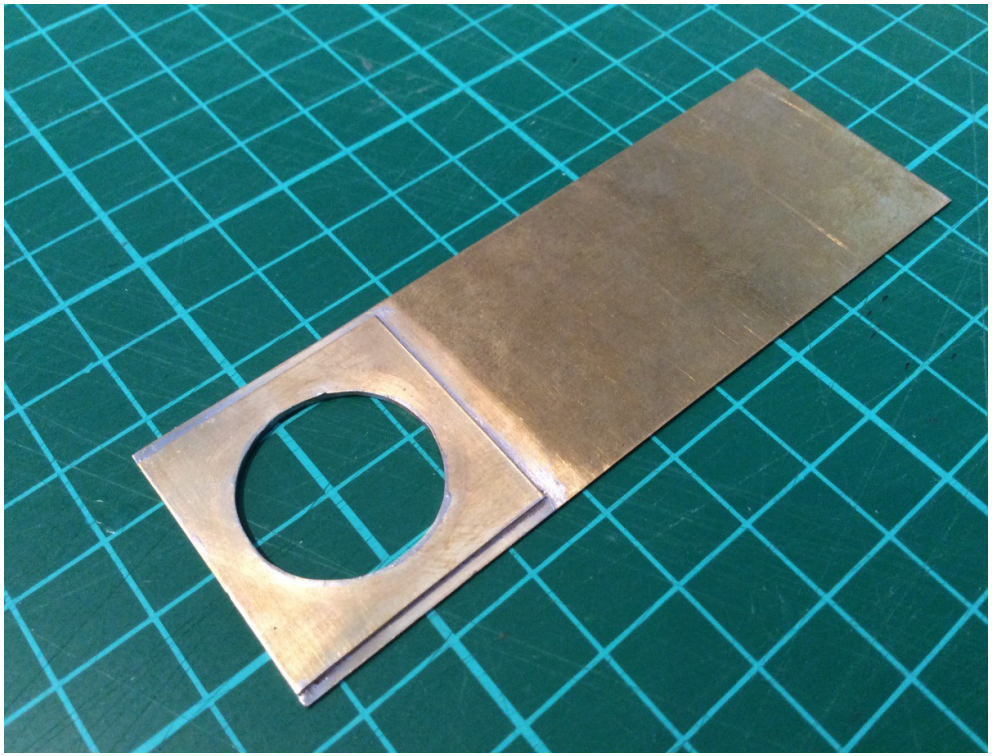


Photo 4

An underside view of the base plate. A square blank bottom bearing plate was then prepared which again had a scribed + lines on it (not shown as it is on the other side) to aid precise alignment for soldering it on in the correct position. It was imperative that it be soldered on perfectly square. A second hole was then cut out using the already pre-cut hole in the base plate as a guide. Extreme care was still taken not to make the hole any bigger in circumference with cutting and filing.

The end plate was soldered straight onto the weight box end of the completed base plate making sure it was vertical. As the wrap round strip is 3mm wide, the sideframes have to be positioned directly in the middle (like a T when viewed end on) so each sideframe was obviously positioned 1.5mm in from each edge. A frame was tac soldered on first (on the inside face) making sure it was vertical. It was then soldered all the way along the inner face seem. Care was still required keeping it vertical when soldering. The same procedure applied to the other sideframe. At this stage, the frames were a bit flimsy and vulnerable even with the 18thou brass, so I quickly soldered on a strip of scrap brass 7mm x 33mm with a hole in the centre for the top of the central support column. It is positioned directly where the cross frame bearing platform (a 3d print) would eventually be located. I will later replace it with a piece of double-sided copperclad sleeper strip (C&L 7ZC101B) which will eventually be hidden and encapsulated underneath it.

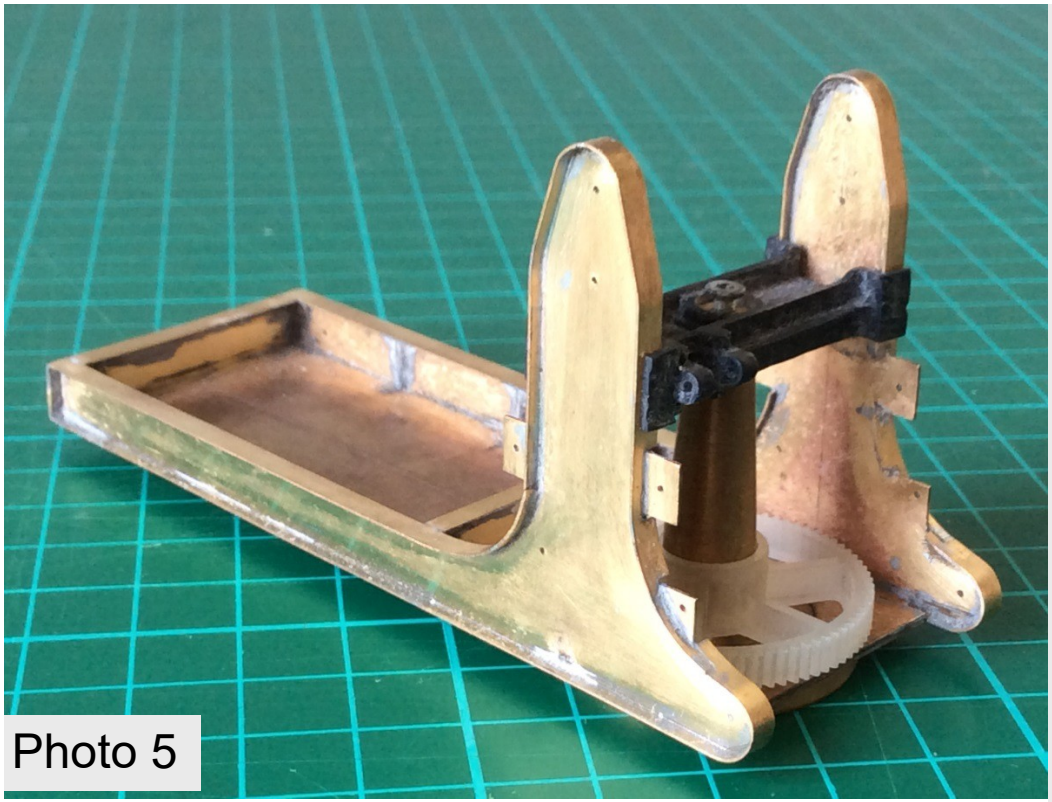


Photo 5

The end piece was soldered onto the base plate first making sure it was vertical. As the wrap round strip is 3mm wide throughout, the position of each side frame was set 1.5mm in from the edge of the base plate. The wrap round strip is not in one piece but several pre-bent segments (minimum of 5 on each). It was very time consuming bending each one to shape making sure there were no kinks or gaps anywhere. Lastly the end plate top plate was soldered on. Just for the photo, the cross frame bearing platform, central support column, and geared slewing ring have been temporarily fitted. The two thin rectangular bits of brass pointing towards the camera will eventually become the brake cross shaft outer blocks; whereas the two thin triangular ones are the brake rod lever brackets. Both will eventually be thickened up (1mm each side) to the width of the wrap round strip.

As mentioned, the whole circumference of both sideframes is a wrap round strip. Settling on 3mm x 0.3mm brass strip (Eileen`s Emporium Ref:F03003D) it took some time bending the numerous segments (ten in all, five each sideframe) to shape. It was imperative there were no kinks or gaps showing around the edges so I mostly used my fingers, tweezers, and rolling around various sizes of tubing and rod. I started with the easiest ones first, the bottom straight with a curved front (jib end). This was surprisingly easy to make and simple to solder on. The edge of the bearing plate helped to keep it straight and in perfect alignment. Again, all

soldering was done from behind, fearing a flood of solder along the front of the joints. After a few days the wrap was completed. Thankfully all went well.
The rivet strip that goes around the whole of the outside face of each sideframe was tackled next. In Part 3, I commissioned Mike Waldron (EBM) to produce a set of the rivet strips for the crane which were sadly not used because the rivets did not show up very well on the underframe. The same happened with the crane body. They simply did not show up. Mike also included the curved bits for the upright section which would have saved me a lot of time cutting them out. Having had to make my own rivet strip for the underframe, I had to make my own for the crane body. Looking closely at the photo of No.19, the width of both riveted strips appeared to be the same, so the same 1.5mm wide x 0.3mm n/s strip (Eileen`s Emporium Ref: F01503D) was used again with exactly the same rivet spacings of 2.5mm. I started with the long bottom strip first which, funnily enough, the rivet press was already set up for. Due to the punching process, the metal started to curve badly straight away and deformed along its length, so it had to be straightened out as I went along. Carefully lining up the bottom rivet strip to the drawing, I knew precisely the length it had to be cut to (86mm). Before it was soldered in position, only a small amount of solder had to be cleaned away from the outside of the joint (solder seepage) with a scalpel and glass fibre brush. The top straight strip was done next (51mm long) making sure the rivets lined up perfectly with the bottom row. The two curves of the central section leading to the vertical straights had more or less the same radius on both which was a bonus. Cutting them out was a nightmare though. Not having any 30thou nickel silver, brass was used instead. Six pieces were cut to 20mm x 40mm and soldered together (two for each sideframe and two spare for spoilages). Again, a printed drawing was glued onto it. Although very tricky, the inner curve was cut first being as accurate as possible. I kept having to marry the cut curve to the wrap round strip as I went along as I did not want any unsightly gaps showing. This procedure took many hours. A lot of filing had to be done for a nice tight fit on all four curves. The next procedure was the hardest, cutting

and filing it back to 1.5mm wide throughout the whole curve. This took less time but still took me the best part of an hour to achieve making sure I did not cut less than 1.5mm throughout the curve. Thankfully due to the thickness of the brass, there were no disasters. Only now could they be unsoldered and cleaned up. They were then marked out and riveted with 2.5mm spacings. Again, the riveting process caused the brass to deform badly and had to be straightened out. After careful tweaking, all four sections were soldered in place.

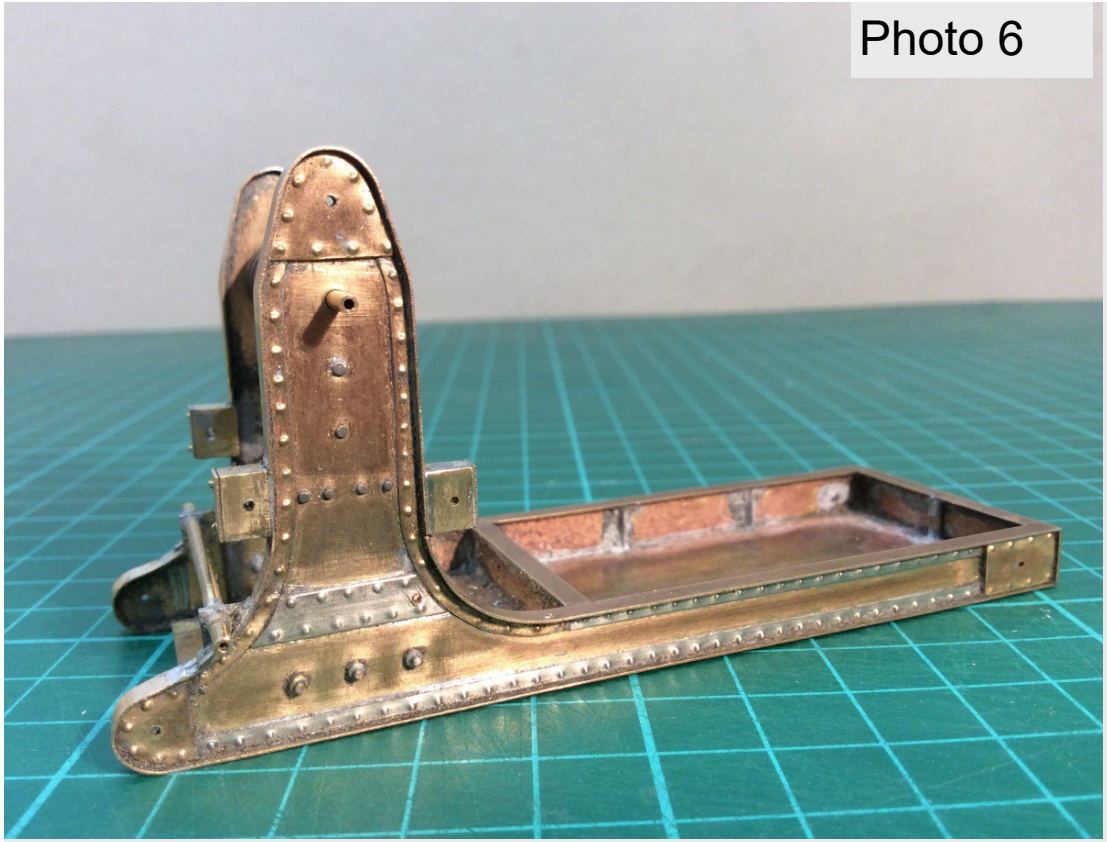


Photo 6

The four long rivet strips (two each side) were punched out first using 30thou n/s strip with 2.5mm spacings on each and soldered on. The vertical sections (two each side) had four pieces of scrap 0.3mm brass soldered together and cut out as one. When cleaned up, they were carefully marked where the rivets had to be punched in. Trying to space and match them up with the existing 2.5mm spacings was a bit tricky. The hardest part though was getting the rivets parallel with each other on both strips. Any difference in levels would show up. The three differently shaped gusset plates were then carefully cut out to shape, riveted, then soldered in position directly over the un-riveted ends of the strips. With the gearwheels in position, I was now able to mark precisely where the extra bolt detailing had to go on the upright sections. Also shown are cross member and brake rod cross shafts which have now to be thickened up to the wrap round strip width (3mm).

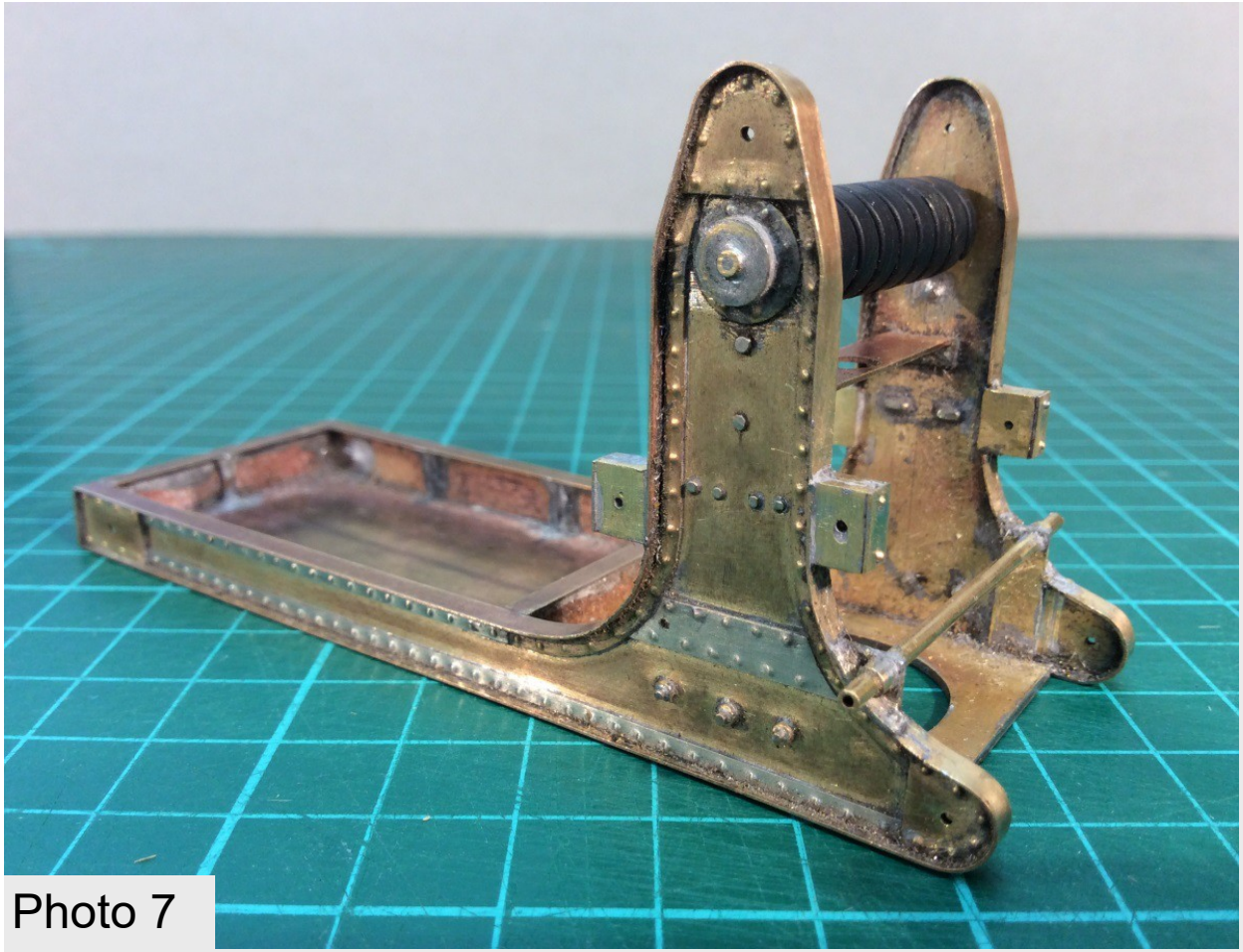


Photo 7

For the camera, I have placed the winding drum (black 3d print) in position above the tempory brass frame strengthening plate where the cross frame bearing platform will eventually be placed. The circular winding drum bearing plate (8mm in diameter) had to be cut out of brass and riveted accordingly (8 rivets in all). The 5.25mm diameter cover was cut out of a thick piece of 1.5mm thick brass with a 1/16$^{th}$ tube in the centre. Thankfully I only had to make one as the other side is completely covered by the large gearwheel. Below the bearing plate are two medium sized vertical rivets (1mm n/s rod), four small parallel rivets (0.7mm n/s rod), and three large rivets (1/16$^{th}$ tubing 1mm thick, and 0.8mm n/s rod). On the photo of No.19, a very faint riveted rectangular plate that can just about be seen behind the facing gearwheel and pinion. I estimated it to be 4mm wide and added 11 rivets on them. On the front of the thickened cross brake outer and inner blocks, I riveted scrap brass covers with two bolts on each and soldered then in place.

Next to be fabricated were the six gusset plates (three per side) using 0.3mm scrap brass. The simplest were the rectangular tie rod anchor plates (10.5mm x 6.5mm) that secure the bottom of each stay rod, followed by the top stay rod plate (11mm x 8.5), and finally the jib plate (7mm x 5.5mm). The rivets were punched in as before, but some rivet spacings had to be lengthened and squeezed slightly to fit.

Behind the bottom left hand pinion on the camera side (not very clear to see) there is a large horizontally positioned riveted plate with double rows of eleven  rivets on it. 4mm looked about right, so a strip of 0.3mm n/s (Eileen`s Emporium Ref:NF04005D) was riveted (11 rivets in all), cut and filed to size, then soldered in place. As mentioned above, it was then time to fit the 18 individual rivets.

High up just below the top gusset plate there is a large circular winding shaft main bearing cover backing plate 8 mm in diameter. A circle of 30thou scrap brass was cut and 8 rivets punched in. The main cover was made from a single thick piece of 1.25mm thick brass which was turned to 5.5mm in diameter. A hole in the centre of both keeps them in alignment for soldering in position.

Well in advance, all of the gearwheels etc had already been 3d printed (some from 3d-companions and some from Shapeways). The largest gearwheel (34mm dia) has 84 teeth; the next size down (32mm dia) has 80 teeth; and the smallest (15.5mm dia) has 40 teeth. The three tiny pinions are all 10 toothed and all to the same 4.5mm diameter. The majority of the axle holes in each varied between 1-1.2mm. I decided in the end to use 1/16$^{th}$ brass tubing (KS125) as a standard axle throughout as it looked about right compared to the photos. One axle appeared an in between diameter, but I was happy with 1/16$^{th}$ throughout. Having a spare 84 tooth gearwheel it was tackled first. If any mistakes were made, I knew I had another one as a back-up. Not wanting to just glue it on the tube it had to be reinforced somehow? Washers sprang to mind. The different size of washers required was 5.5mm for the front, and 9.5mm for the rear x 0.5mm thick. These

were cut out in pairs (another set for the 80 toothed wheel) and filed `as one`. A 1/16th hole was then drilled through them for the tubing. A small 3/32nd collar (KS126) 1.5mm long was soldered directly onto the end of the tubing, then the 5.5mm diameter washer soldered onto it. The gearwheel was then Araldited behind it making sure the wheel was dead straight with absolutely no wobble. When semi set, the 9.5mm diameter washer was glued onto the rear of the wheel. After drying overnight, a small 2mm thick 3/32nd collar was soldered on the back. I was very frightened the 3d print would melt, but thankfully it did not and was fine. Happy with my first effort, the remaining gearwheels were assembled in the same way knowing they would not come apart with handling. The pinions on the other hand were glued directly onto the tubing as two of them are not removable from the sideframe.

Fitting the largest gearwheel first gave me a big headache. How to encapsulate the winding drum via the axle, make it rotate, and be easily removable? As it happens, the hole through the winding drum was quite large at just under 2mm. So I drilled it out to 3/32nd and glued in a section of tubing. Two small 1.5mm thick packing pieces were then soldered on to the back of the sideframes so the winding drum was a tight fit. The axle from the gearwheel then passes through the sideframe/winding drum, then onto the back of the winding shaft main bearing cover. At the moment the gearwheel axle is a tight fit between the fitted pinion so it may not require a securing pin to hold it in place. To stop the winding drum rotating, I will temporarily fit a retaining pit through it, which will pass the cross frame bearing platform which will be glued on next. The remaining gearwheels were then assembled in exactly the same way through their respective axle holes.

Fitting the 3d printed cross frame bearing platform over the sides of the vertical sections was another headache. It fitted snugly over the double-sided copperclad frame spacer below, but it took me ages getting the four ends filed down for a perfect fit over the frame itself. During this process, two of the thin ends broke off the print, and two of the others were too short. After gluing in, these areas were filled by soldering on 1mm thick brass packing pieces over the frames.

Photo 8

Photo 9

The largest 84 toothed gearwheel was going to be the guinea pig test wheel to start off with as I had a spare. If it had gone wrong there was a back-up. For strength I thought it best to sandwich it between two different sized (home-made) washers. The smallest being 5.5mm in diameter, and the largest rear one being 9mm in diameter. Choosing 1/16$^{th}$ brass tubing as the axle, I first soldered on the smallest washer with 1mm protruding out of the front. It was then Araldited in position making sure it was perfectly square with no wheel wobble when rotated. When set, the rear washer was glued on. I then very carefully soldered on a small 1.75mm wide 3/32$^{nd}$ brass collar encapsulating the wheel. Being soldered together, there is no chance of the wheel coming apart or rotating on the axle.

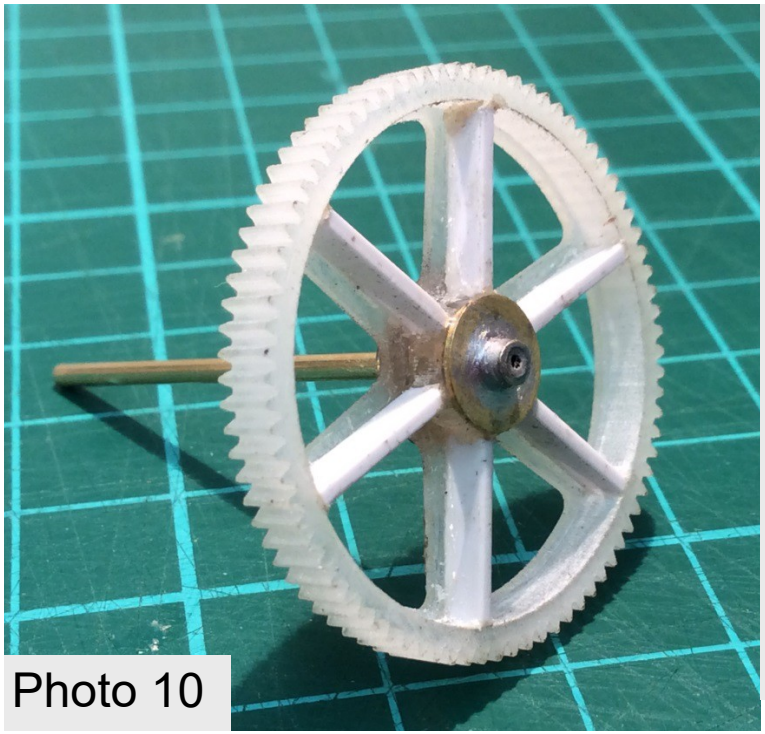


Photo 10

Very similar to the black 84 toothed gearwheel is the slightly smaller 80 toothed gearwheel which is a Shapeways print. It was fitted with the same 1/16th brass tubing and homemade brass washers as the larger gearwheel. Gleaming with the photo, the outer washer is much larger in diameter at approximately 7mm. Due to a slight error in the original artwork, which was something even I overlooked, the `I` sections of the six spokes were missing. Instead of getting another print made, I simply Araldited on prepared 11.0mm x 2.75mm 40thou Plastikard segments. They can just be seen being slightly whiter in colour than the frosted print.

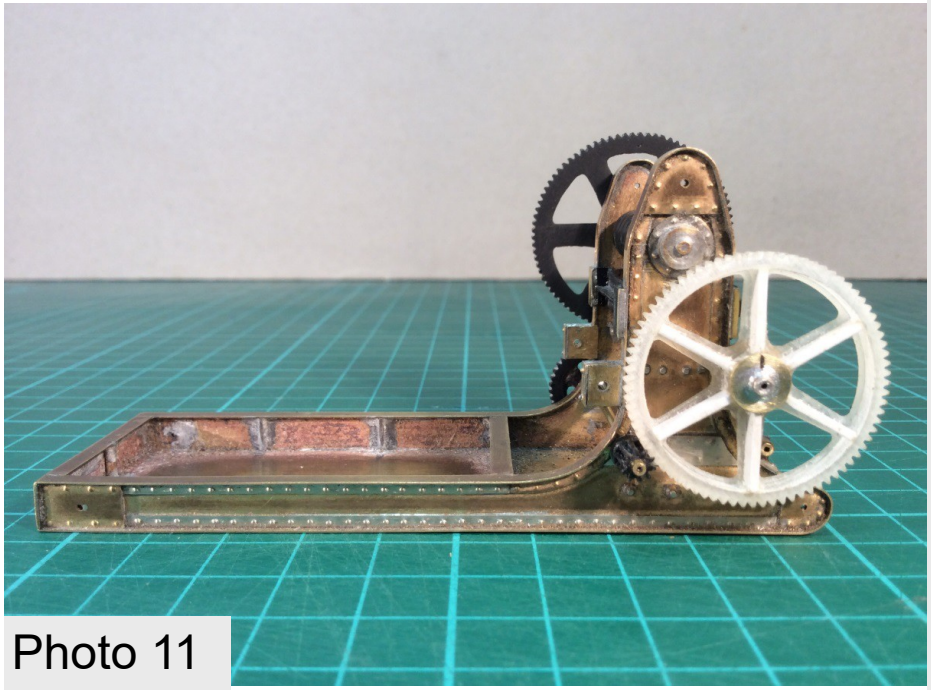


Photo 11

Photos 11 and 12 Both the 84/80 toothed gearwheels temporarily fitted in place. The 80 toothed gearwheel axle passes through both outer cross brake shaft blocks as shown. Eventually the axle will be held in place by a securing pin through a small collar (3/32nd brass tube) on the inner side of the right hand block. Also fitted are the two tiny 10 toothed pinions which have been glued onto the spigots that were soldered into the outside and inside faces of the blocks. As mentioned in the text, the position of all axle holes had to be precise for acurate meshing of the teeth between gearwheels and pinions. As can be seen, the

corkscrew thread of the winding drum also shows up particularly well. In reality, the chain links would locate in the groove and the flat of the chain would lay flat on the outside face of the drum. I am hoping the chain links supplied will do the same in model form. It must be mentioned though this will be a static model only.

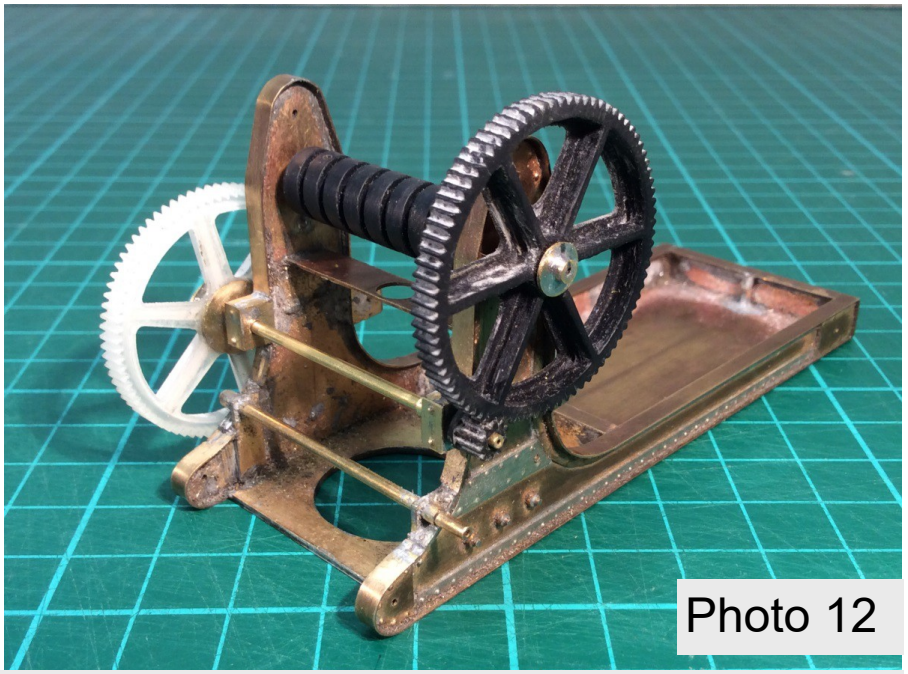


Photo 12

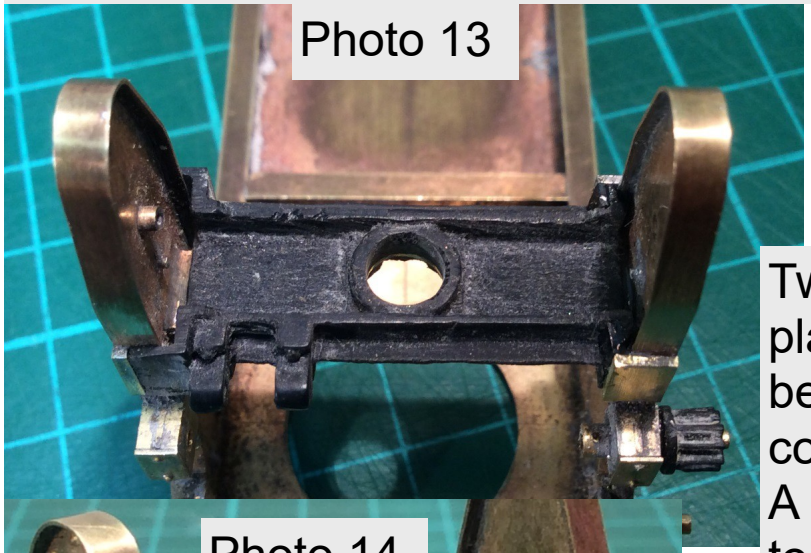


Photo 13

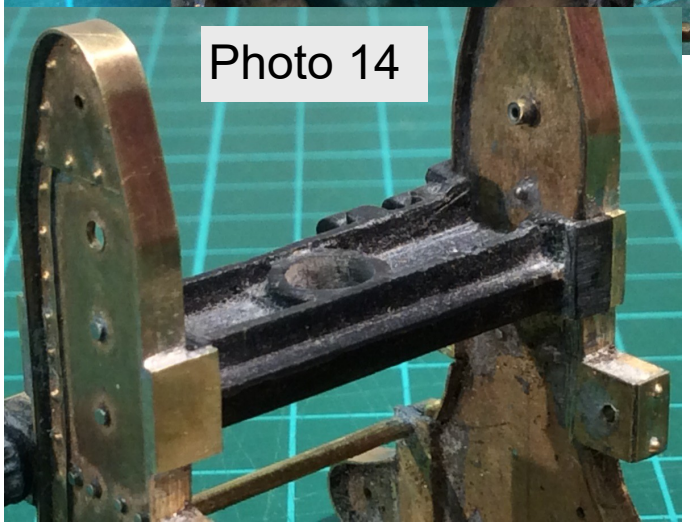


Photo 14

Two views (13 and 14) showing the cross frame bearing platform glued in position. The temporary piece of brass in between the frames has been replaced by the doublesided copperclad sleeper strip and is completely hidden underneath. A hole was drilled out for the top of the central support column to pass through. The frame was designed to slide down over the edges of the sideframes, but it was printed a bit narrow and a very tight fit. The photos clearly show the extra bits of thick brass packing pieces I added so they now finish flush on the extreme edges. Again, I hope the join does not show up after painting. The two moulded clamps (front left) are for the top of the brake band which wraps around the brake drum which in turn is operated via the two long brake levers.

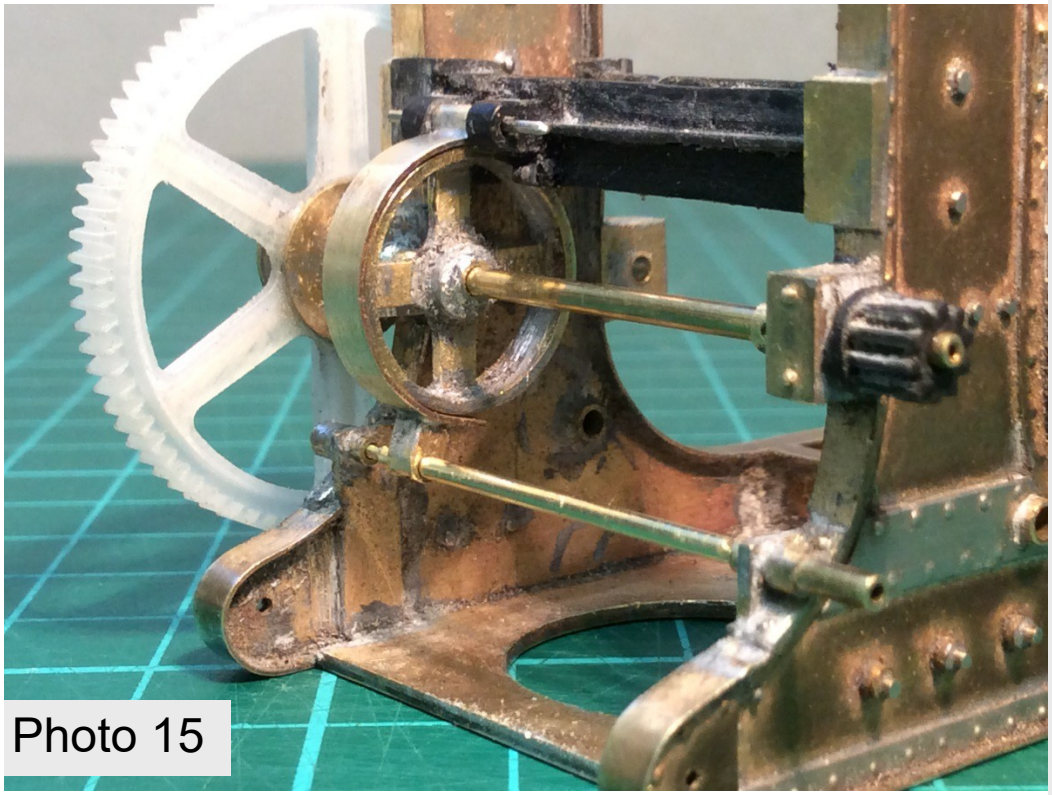


Photo 15

The 3d printed brake wheel could not be used on the model because, when I was fitting it, the very thin spokes broke into numerous bits, leaving just the rim. I thought of repairing it by cutting out a brass washer leaving just the four spokes intact. It would then be glued in place. I did not think it would be successful or strong enough, so a scratch built wheel was made from two sizes of brass tube (17/32$^{nd}$ and 1/2inch) 3mm wide and soldered together. The completed wheel was then soldered over a hollow 1/16$^{th}$ tube, which in turn was soldered to the inner face of the left hand brake shaft outer block. The 80toothed axle can then pass through both the block and wheel which then locates into the other brake shaft block on the right (behind the pinion). If at any time the gearwheel requires attention or replacement, it can be simply slid out, leaving the brake wheel and band intact. Later in the build, when the model is nearing completion, I will finally attach the two brake leavers that are fitted to the bottom brake rod cross shaft. If fitted now, they are liable to get bent and damaged.

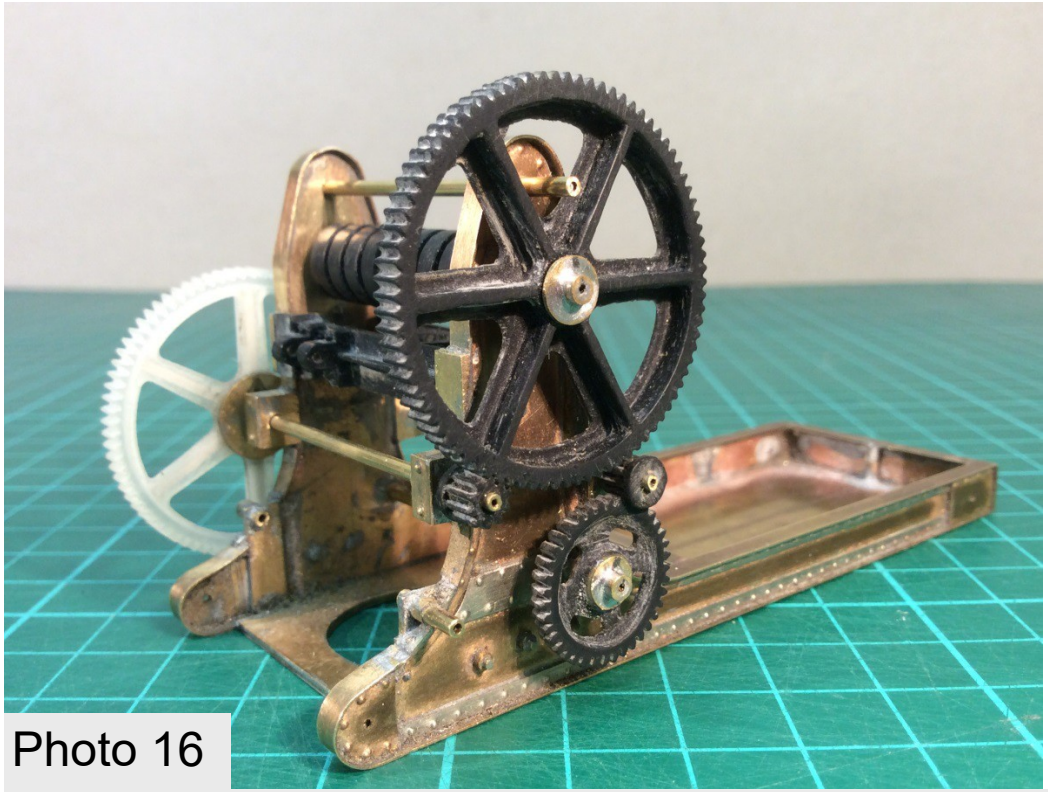


Photo 16

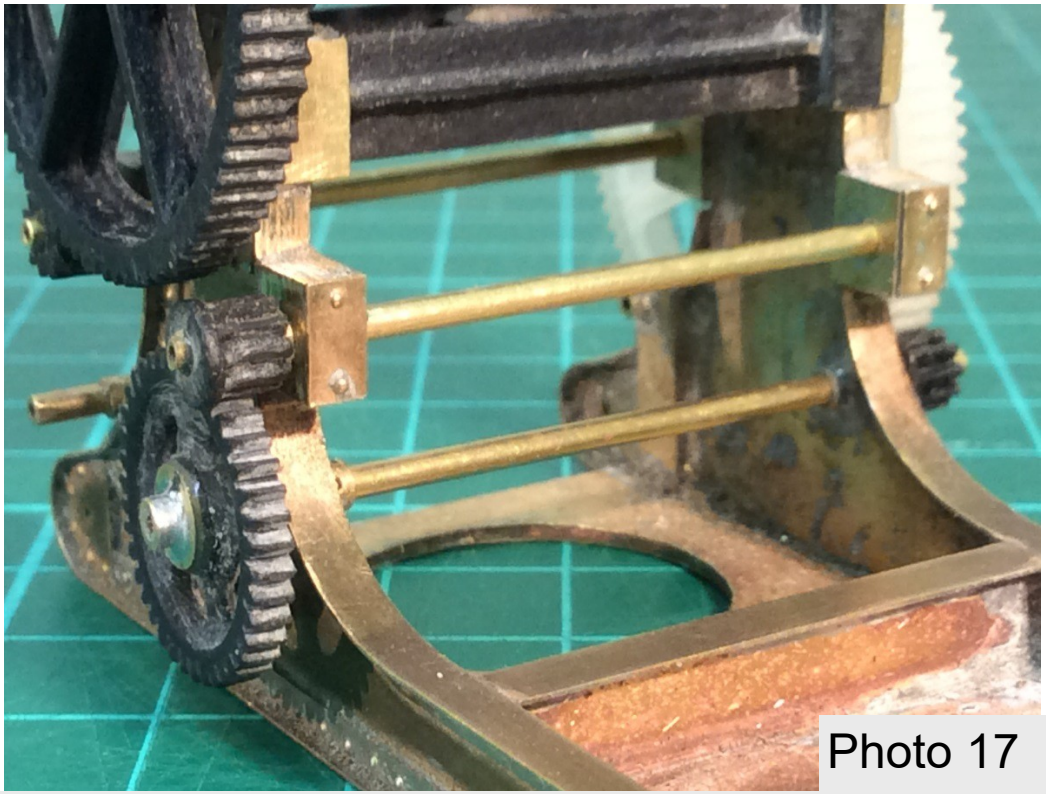


Photo 17

The smallest 40 toothed gearwheel (bottom gearwheel facing the camera) was again made in exactly the same way as the larger two gearwheels sandwiched between 5mm diameter washers. The gearwheel axle passes this time through the left hand sideframe, whereas the end of the axle (extreme right hand side) locates into the 3/32$^{nd}$ tube soldered onto the inner face of the sideframe. The gearwheel is meshed via another small 10toothed pinion above, which operates the whole crane. In reality, a crank handle (stowed away in a tool box on the match truck) would be inserted into the front of it to work the crane. I presume there would be a cog and ratchet arrangement behind the frame which has yet to be thought out and will be modelled accordingly. The pinion on the outside face of the right hand sideframe has been glued onto a small spigot and meshes with the 80toothed gearwheel. In the foreground of photo 17 there is a stiffening cross member which doubles up as a mounting plate for the gearbox hand wheel stem.

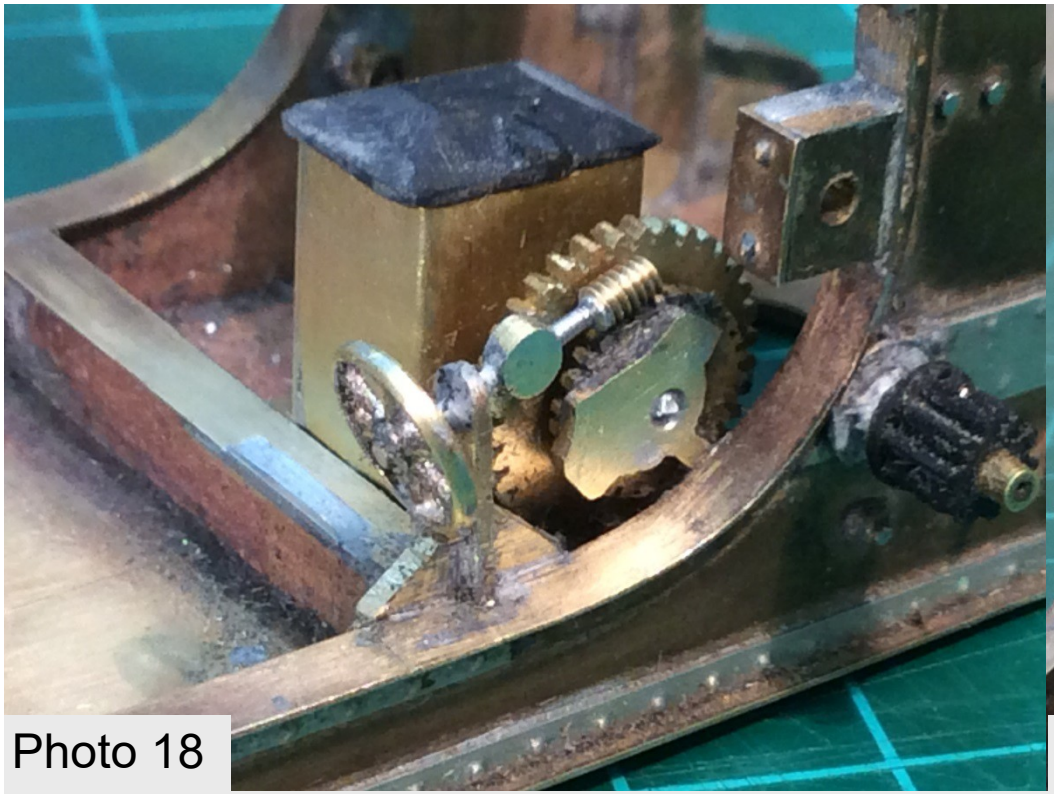


Photo 18

Photo 19

These two views show the new gearbox and gearwheels assembled. It took a lot of effort getting to this stage as it was a very complicated scratch build. Only the 3d printed roof was used in the end which had to be filed smaller all round. Sadly the printed cam and gearwheels could not be used as they were too large in diameter. Clearly shown are the two `new` scratch built gearwheels (12mm and 8mm) which were cut out of thick brass with individual teeth painstakingly filed out. Not being a watch maker they were the best I could do. The gearbox has had to be designed to be removable (noted by the L bracket and bolt head in photo 19 with captive nut underneath). When fitting the crane body to the chassis, the slewing ring has to be manoeuvred in from the back and slid over the central support column at the same time. The gearbox can then be fitted only when this is in place. The large opening underneath the box is where the slewing ring passes through. It was a very tight fit getting everything lined up as there was not much room.

There are clearly two long levers pointing away from the front of the crane just above the jib pivot point. We think they are to take up the tension of the gearwheels via a strap wrapped around a wheel (brake wheel?) to stop excess travel (I could be totally wrong in my assumption). It is not very clear on the photo of No.19, but clearer on SR No.307s as it is in full view. The top of the strap is mounted on the front of the cross frame bearing platform by a securing pin. The bottom is connected via another cross shaft which in turn is operated by the levers. I was thinking of gluing the 3d printed brake wheel in position on a 6.5mm long 3/32nd tube spigot with a brass strap in front of it (somehow). The axle of the smaller 80 toothed gearwheel could then pass through if it required removal. After much thought, this is what I did. A disaster then happened. Trying to prize the brake wheel into position, it snapped into many pieces as it was a bit on the thin fragile side. Thankfully I had a spare one but it was not printed very well so I had no option. I had to make a new one from scratch using brass tubing. Measuring the spare it worked out to 3mm x 17/32nd (KS140) in diameter. As the brass was a bit thin, a ½" (KS139) telescopic tube was used to beef it up inside. The wheel centre was cut out of a round disc of brass leaving the spokes intact. Once done, it was slipped in position, but I damaged the right hand bracket in doing so, so this too had to be repaired from scrap brass and home turned bolts. The brake band (using the same material as used for the wrap round strip) was then pre-bent around the brake wheel and is secured by a top pin and a bottom brake lever cross shaft.

The two long vulnerable brake levers were made from 1mm thick n/s. From the pivot point, they roughly measure 29mm. The outside one is slightly longer below (11mm) for the counter-weight disc. Both are 2.5mm (widest pivot point) tapering down to 2mm at the top. There is a short narrow 4mm long x 1mm wide hand grip on the top of each. The counter-weight is a turned disc measuring 7mm x 2mm with a cut out slot on the back.

The two long diagonal stay rods were tackled next. These again have had to be designed to be made removable. Looking at the photo of No.19 they are obviously thin, but in model form they

are vulnerable and are liable to be damaged with handling. 1mm rod looked a bit thin, whereas 1/16th brass tube (for strength) was very slightly too thick therefore in the end 3/64th brass rod (KS161) was used. The top end attachments were cut out from scrap 1.25mm brass soldered on the end with a slot cut into it for the rod. The two were then painstakingly cut and filed round to match the photos. Thankfully only two had to be made. Finally a 0.8mm hole was drilled for the centre for the top shaft. The bottom stay rod attachment that is mounted on the front face of the rectangular anchor plate was filed from a solid piece of brass, which was cut to 4mm x 3mm x 3mm and rounded off at the front like a D in profile. It was then drilled out for the 3/64th stay rod to slide into. Carefully lining everything up with a rod in place, it was soldered onto the plate.

Just to the right of the anchor plate there is a vertically mounted cylindrical item fitted with what appears to be a hand knob on top. John Ritter in Australia mentioned to me that he thinks they are early hydraulic jacks, that were fat and stubby with the characteristic loop handles that push up and down to pump a central ram down onto the deck, to stop rotation of the crane body. The nut on the cylinder is a pressure relief valve, to free the ram. He goes on to say that they were possibly not used that much. Later photos of SR No.307s confirm that they were taken off in Southern days, but, in the absence of pre-grouping photos, we cannot say precisely when they were removed. My versions were made from 5/32nd tubing (KS128) 7mm long, telescoping down to 1/16th in the centre which was cut to 9mm (1mm showing both top and bottom). The looped handle was made from 0.5mm round brass rod in a jig. The completed cylinders were then soldered onto a prepared U bracket, which in turn were soldered to a rectangular backing plate. The whole assembly was then soldered in position on the sideframe.

The weightbox was another complicated scratch build that led to more headaches. Thankfully I had four 3d printed flanged wheels, sides and ends, and a roof. Close examination of the wheels

reveals they are slightly larger in diameter (at least by 1mm) than they should be, but I can live with this error as they are nicely printed and are not really noticeable. Although quite thick at 3mm (with a 2.5mm tread), I still did not want to glue them straight onto ends of the 1/16$^{th}$ brass tubing, so I copied the same method as used on the gearwheels with a 7mm brass washer soldered onto the tubing, then glue the wheels directly on. When dry, the edge of the washers were turned down nearly flush on the edge hiding the thickness. Lastly, the flanges were very slightly turned down as they were a bit coarse in relation to F/S O.

Close examination of the weightbox sides proved they too were not printed very well, with some of the corners lacking detailing (Francis did say at the time he had problems with his printing machine). A couple of the corners too were a bit curved and damaged. In the end I decided to make a new one out of brass. The four sides were cut to 27.5mm (W) x 34.5mm (H) using 18thou brass and holes drilled out for the wheel axles.

The eight corner plates have two differing designs. The two side ones are plain with a straight line in between the top and bottom curved ends with no rivets, whereas the ends have two extra small semi-circular curves added and have four rivets in each one. I decided to solder eight pieces of scrap 0.3mm brass together, and cut them out `as one`. It took me the best part of a couple of hours to achieve the shape required. The hardest areas were the semi-circles in the middle. The parts were then unsoldered and cleaned up. Four of the strips then had the middle semi-circles removed and rivets added. Soldering them onto the prepared brass panels, one strip was positioned flush with a side, whereas the other stuck out by 1mm. This was done on the remaining three. When soldered up, I knew it would be perfectly square. Any excess brass on the edges would then be filed off later. The missing gaps along the tops (underneath the roof) and bottoms were then filled in with 1.5mm x 0.3mm strips of n/s.

The company's cast name plate (one each side) reads:

JOSEPH BOOTH
and brothers Co.
Rodley, LEEDS
10TONS

These too had been 3d printed with clearly defined letters and are a gem, but were too thick. On the photos, the plates do not seem to stick out far. To avoid the risk of damage filing them any thinner, the only way they could be fitted was to cut out and file a recessed hole (matching the plates exactly) in two of the side panels and sink them in slightly further by a good millimetre. A rectangle of scrap brass with a 0.7mm thick n/s packing strip was soldered on the back. Placing the maker's plate in position looks more or less like the photos. They were not glued in until the box was completed to avoid the letters getting damaged with handling.

As mentioned, I wanted to use the 3d printed roof but was worried the thin edges would get damaged over time. My fear was confirmed when I tried to prize off the roof from the dummy cardboard weightbox when a 2mm chunk snapped off one of the corners. Not wanting to glue it back on, I decided to make a new roof from brass. Each segment of the 3d printed roof measures 29mm (along the base) x 21mm x 21mm, so four were cut out using 10thou brass. All four segments were then tack soldered in the corners. As they were cut out very accurately, now filing had to be done to any edges. The roof was perfectly square and did not wobble when laid flat. I then carefully soldered the seams on the inside. For more strength, a piece of 27mm square scrap brass was soldered on the bottom, but more importantly it gives a firm base for soldering it directly onto the top of the weightbox proper.

Photo 20

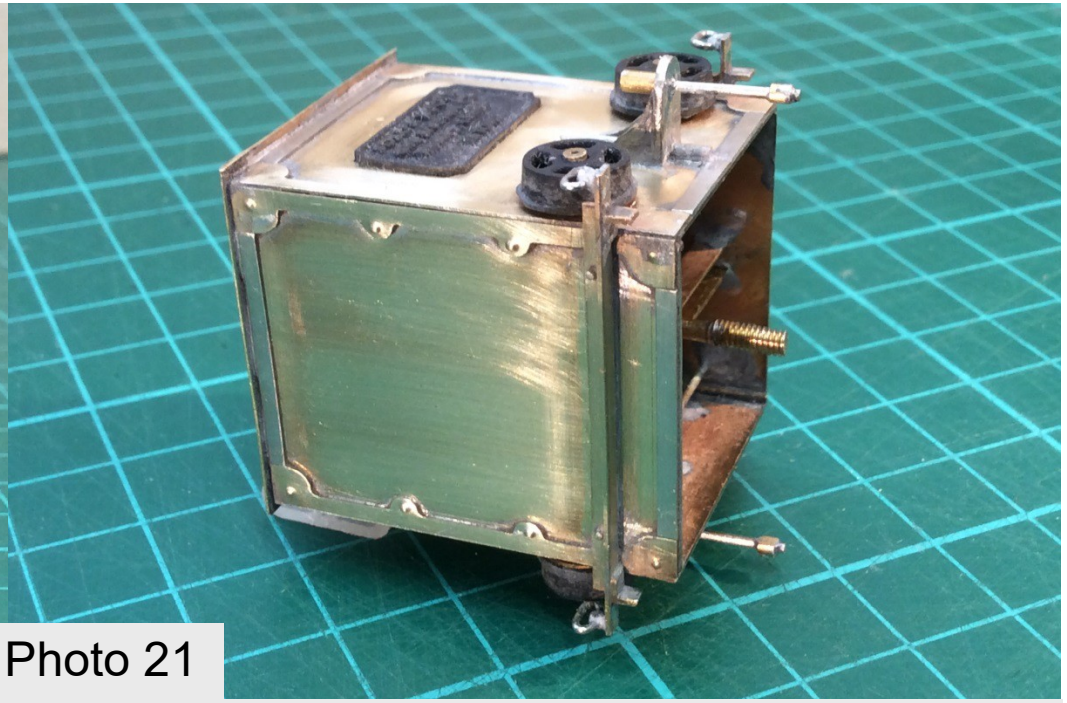


Photo 21

Due to space, I cannot give a blow-by-blow account of how the weightbox was actually constructed as it was very involved. It would an article in itself. The first thing to mention was turning down the wheel flanges which now look very prototypical. The roof was made next which gave me the exact measurement for the four panels. All of the eight corner plates were then cut out as one, riveted, and then soldered onto the prepared rectangular panels. The panels were then assembled making sure it was perfectly square. There is some bracing within the box. Not very clear, but can just be seen, are the four tiny guide L brackets underneath the long angled strip that rub against the inside face of the runner. These brackets keep the box perfectly square and in line with the crane body. To secure the box in place, a threaded bolt is soldered to the small loop on top of the roof and passes through the box body. The bolt then passes through the crane floor onto two strategically positioned captive nuts (one travelling position, the other working) securing it in place. Finally the two maker's name plates were glued into the recessed holes. They both stick out about 1mm from the sides.

Low down in between each pair of wheels, there is a very thick bracket in the shape of a **U** with two curved vertical sides. In model form, the thickness appeared to be around 0.75mm. As an experiment I initially cut out a pair on the flat from thick brass, then bent up the sides. Though successful, the bottom flat had a slight curve to it which did not look right. Trying to file the curve out made it worse. Another one was cut out this time using thinner brass which looked better, but I still wasn`t happy. The only alternative was to cut out the individual parts from thick scrap n/s. Fearing the whole lot would come unsoldered when soldering it onto the panels, I designed the base with a spigot on the back which corresponded with a pre drilled hole in the sides. Soldering them in place (initially from behind) was a bit tricky getting them perfectly horizontal in two planes. Once done, the two sides were then simply soldered on top of the base. In between the sides and just down from the makers plate there is a long thin rod which was represented by a 0.6mm n/s rod. Positioned directly on the underside of each base there is a thicker vertical rod that appears to, but does not quite, touch the outer face of the wrap round strip on the sides. 0.8mm n/s rod was used in this case. Small 2.5mm long 1/16$^{th}$ tubing was used to represent the nuts (I think they are nuts).

Looking at the photo of SR No.307s, there appears to be two long thin **L** brackets positioned low down on the inner and outer ends which almost touch the top of the pulley wheel runner. I estimated its size to be 2mm x 2mm (Albion Alloys Code A2). With the wheels temporarily in place, the weightbox was positioned on the runners of the crane body. I carefully marked where the bracket had to be positioned. Two strips 37mm long were cut to length and soldered on. Set in slightly are two bolts in which I used 0.7mm brass rod. Close to the ends are the same sized flattened looped handles (I think they are used for securing the weightbox down in any position) as used on the hydraulic jacks, so the same jig was used again. Home turned pins were made and soldered the bottom of each loop hiding the gap. They were then soldered into holes near the bracket  ends (1mm in). Whilst in position, I noticed a small amount of slop from each wheel

flange (only 0.5mm) but enough to be visible and leave the weightbox not parallel with the crane body. I simply cut four small 2mm x 2mm **L** angles and soldered them directly underneath the long **L** bracket just behind the runners edge. The box is now quite tight but can easily be moved to different positions via captive nuts.

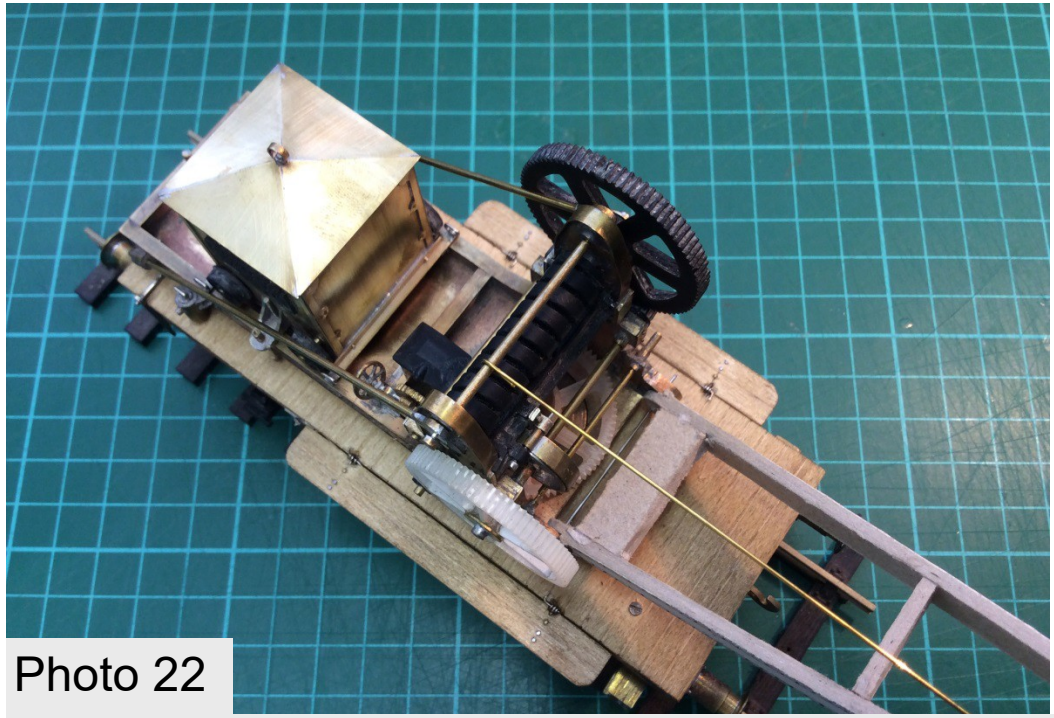


Photo 22

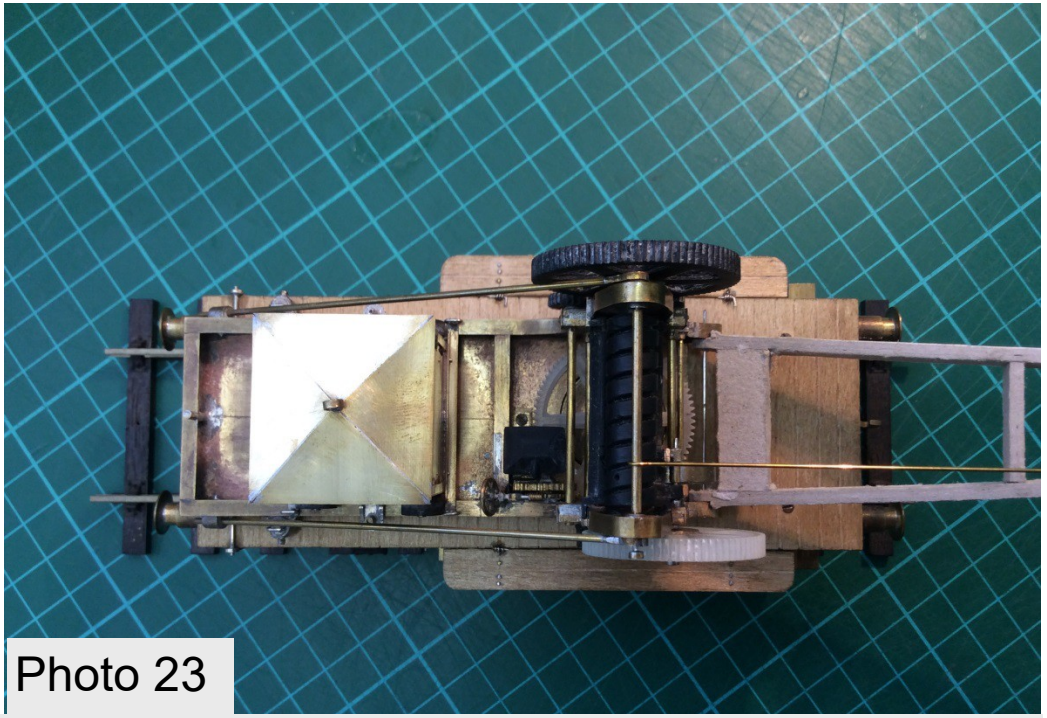


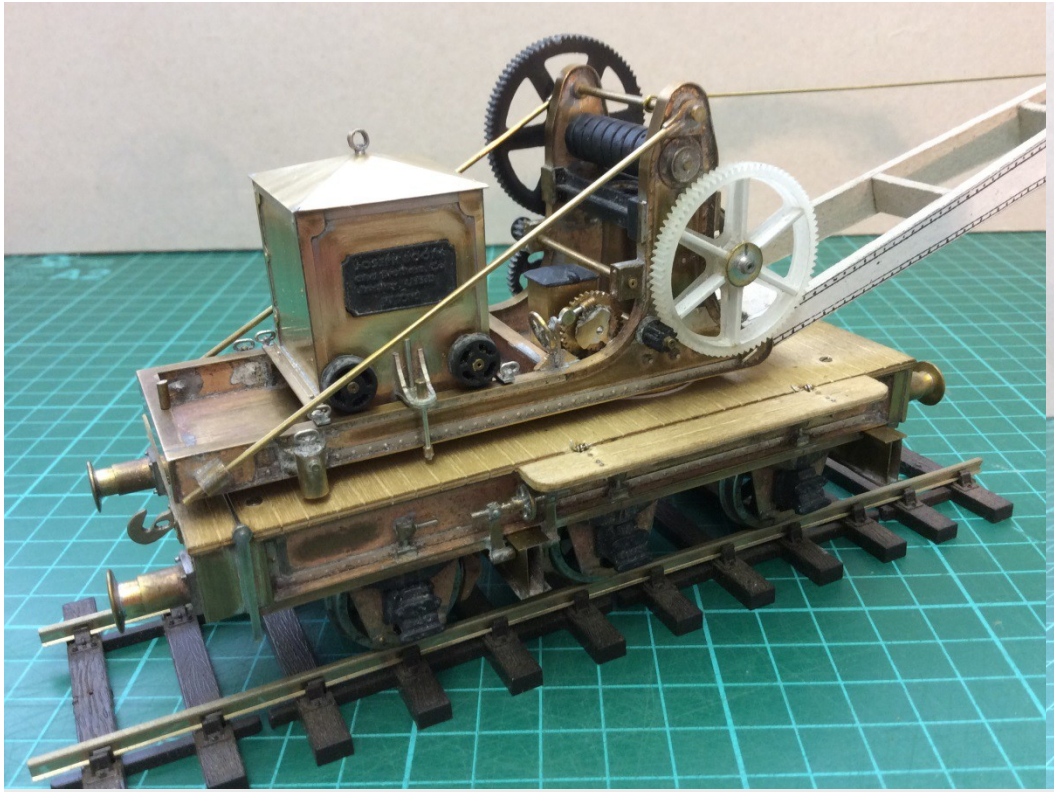
Photo 23

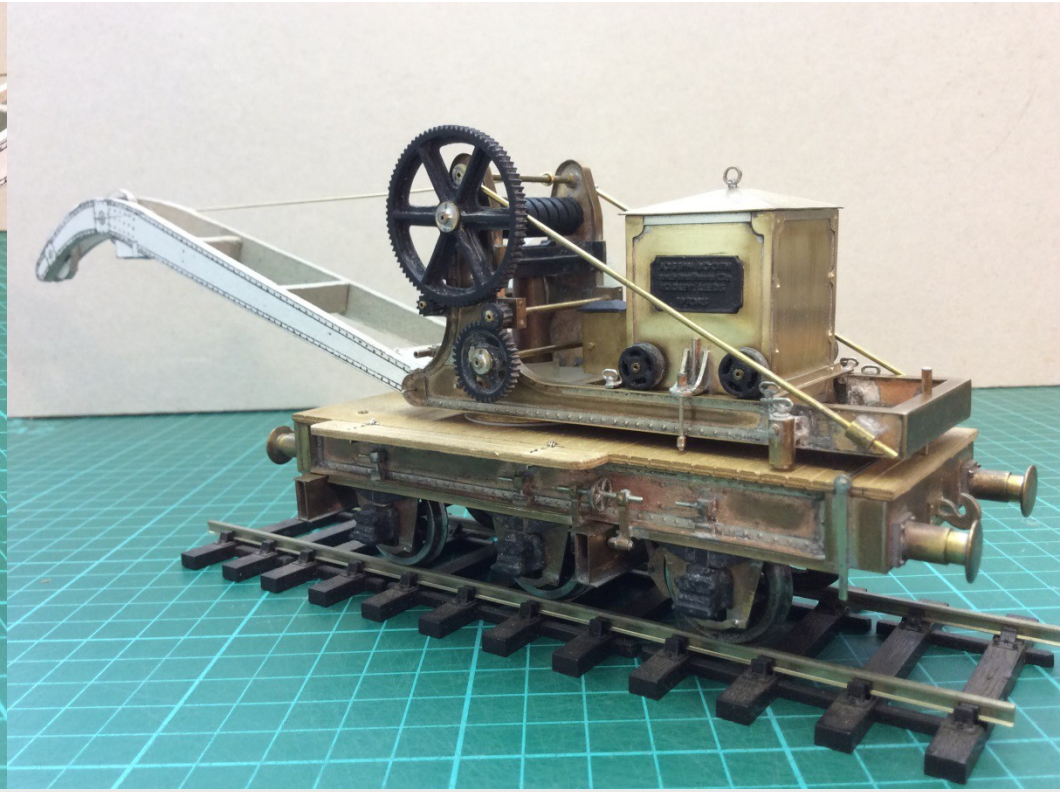
Two aerial views, showing the very cramped space to fit everything in. When assembling the crane, the hardest item to fit is the white 3d printed slewing ring which nestles in the bowel of the body over the central support column. The only way it can be fitted is with the gearbox and two axles removed. This must have been a problem when the real cranes were assembled. The diameter of the wheel is larger than the measurement of the wrap round strip which is clear on the photos of SR No.307s. The model has been designed in such a way that virtually every item can be removed in sub-assemblies for painting and maintenance once fitted. Note the perfectly square roof of the weightbox.

Finally. It wasn`t until I had very nearly finished fitting the 3d printed gearbox/gearwheels/cam and hand wheel I noticed a very big error. With the finished weightbox in the travelling position, the position of the handwheel * on the end of the worm shaft seemed very close and almost touched the inside panel of the weightbox. It was just too close for comfort. On the photo of No.19 there is a clearly defined gap in between the two. I also noticed the overall diameter of the hand wheel was slightly large when compared to the pulley wheels. I pondered for a while thinking how it could be that close? Comparing the photo and drawing again the penny finally dropped. The bottom edge of the gearbox roof did not quite line-up with the curved spoke line of the 80toothed gearwheel. It worked out to be a good 2.5mm too high. The overall width of the gearbox too seemed a bit wide but not too noticeable. Also the vertical stem of the handwheel support (which was already fitted) was positioned 3.5mm too far to the left on the straight, and should have been positioned at the start of the curve to the upright section. The error seemed to be in the drawing I went by from the start which I thought was correct. The overall dimensions of the box etc were obviously too big which exaggerated the size of everything else that followed. I first altered the position of the weightbox on the drawing to more or less the position in the photo (+/- 1mm). Then after trial and error, the gearbox/gearwheels/handwheel drawing was subsequently reduced overall by 20%, and the artwork amended. The height of the gearbox is now in-line with the gearwheel, but more importantly, there is now a clear gap between box and handwheel. So reluctantly, and after much thought, the whole assembly was removed.

* The handwheel on the worm shaft meshes on top of the small gearwheel with the cam in front of it. It then rotates (on the same shaft) the larger gearwheel which in turn drives helical gearing within the gearbox housing which, again, is connected vertically down to the slewing ring thus rotating the whole crane. I am not sure what the cam does. Perhaps it engages and disengages the worm somehow to limit rotation of the crane?

A new gearbox was made first now measuring 15.5mm (H) x 9.5mm (W) x 7.0mm (D) and fabricated from 10thou brass. It was still a bit tight clearing the slewing ring which bisects it underneath. It has an **L** bracket soldered to the inner face of the box and behind the slewing ring which secures it in place. The old 3d printed roof was cut off the old box and glued onto the new one. It was then filed all round leaving a small lip. The next items to remake were the two new gearwheels as the 3d printed ones were too large and could not be used. So two new scratch built gearwheels had to be made from 1.25mm brass. The smallest gearwheel now measuring 8mm in diameter has 29 teeth, whereas the larger 12mm diameter wheel has 34 teeth. In reality there should be a lot more teeth in each, but it gives a representation of geared wheels. A new cam was also cut out and shaped, copying the one in the photo. A 1/16$^{th}$ square section brass (KS149) 11.5mm high was used for the large gearwheel support stem which was soldered to the base plate. Its precise position (in from the front edge) was guess work at first, trying to fit everything in. I also had to make a new handwheel this time using 9/32$^{nd}$ brass tubing (KS132) x 0.75mm wide with 0.5mm n/s spokes, and a new handwheel support bracket (scrap brass) 8mm high. For the worm, I used a 10BA brass bolt cut to 2.5mm long and drilled it out to accept the 0.7mm n/s rod to pass. The angle of the worm shaft near enough matches the angle in the photo.





And finally the completed crane body mounted on the chassis. To get to this stage it has taken me the best part of a year on the crane body alone. Hopefully it gives you an opportunity to view a complicated scratch build. The two long diagonal stay rods have been fitted, but can be removed easily when required. A retaining pin goes through the top attachment rod, then passes through the top shaft rod that is sandwiched in between the frames above the winding drum, and encapsulates the other stay rod on the far side. When fitting this rod, I had to slightly move the position of the large 84 toothed gearwheel (the black 3d printed one) outwards so the rod could pass behind. Also fitted are the two thick hydraulic jacks that are located just behind the weightbox rear wheels. They were soldered up from brass tubing of various diameters, then soldered straight onto a bracket and riveted back plate. A hole was then drilled through the tube, bracket, and sideframe. A rod passes through to simulate a nut on the outside. For the record, I

filed a hexagonal nut on the rod and under a glass it can be seen. On the model, to keep the crane in the `locked` travelling position, I have drilled out a hole on top of the end plate. A retaining pin is then inserted (as can be seen poking out the top) which passes through into the decking. At the moment it is way too long and will be cut down shorter later. I am still using the original cardboard mock-up `jib` for the moment until I design a brass one.

This finally concludes at long last the building of the crane body. I don`t think I`ve left anything off the model. If anything has been forgotten, I will update in the next article. Having spent many months and long hours on this complicated scratch build to date, it will hopefully be relatively easy constructing the final part the jib which will be Part 5. Knowing my luck, the jib will be as complicated as the crane body described above.

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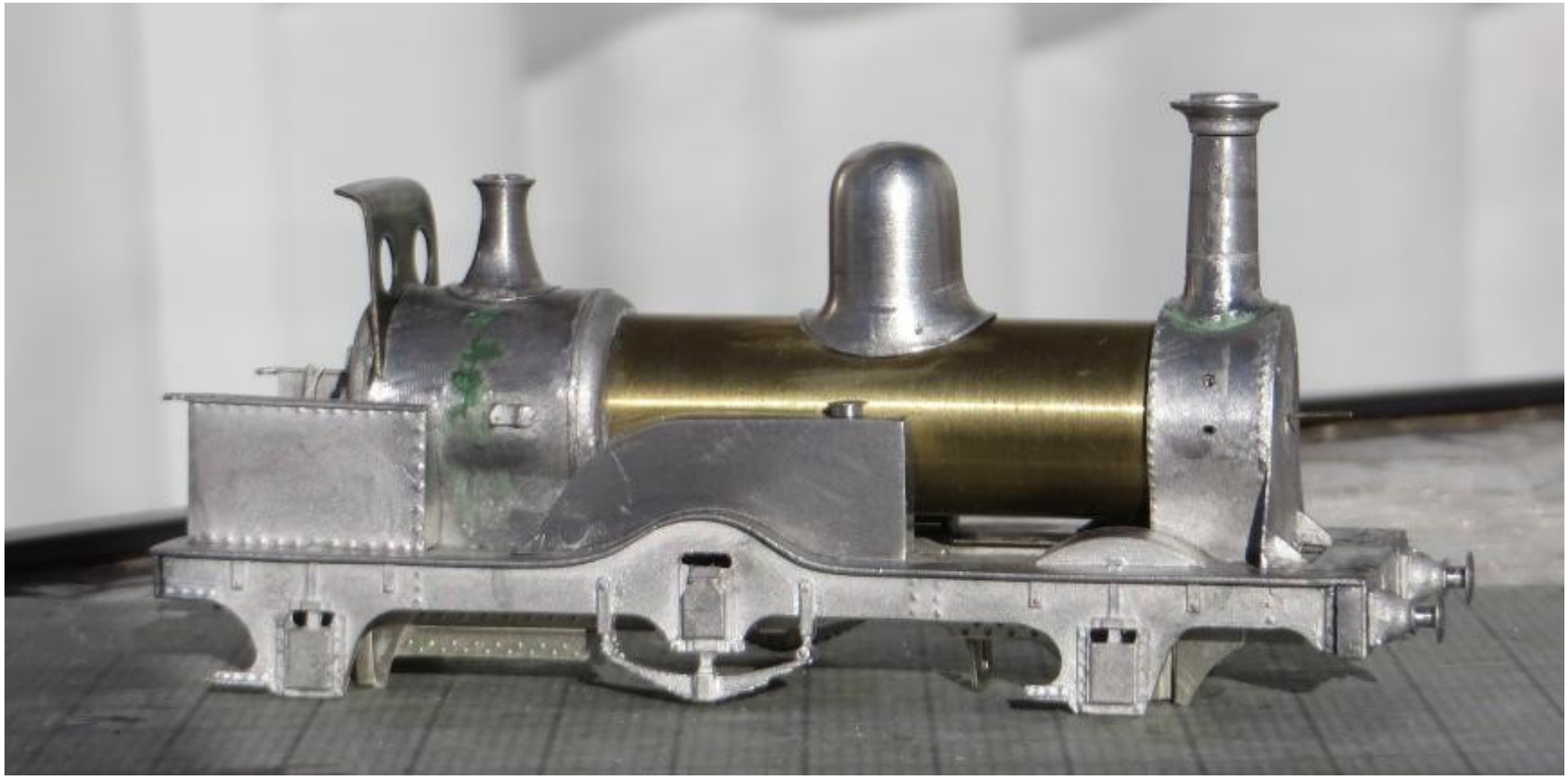
# Polegate - a Nasmyth Wilson single

## By Eric Gates

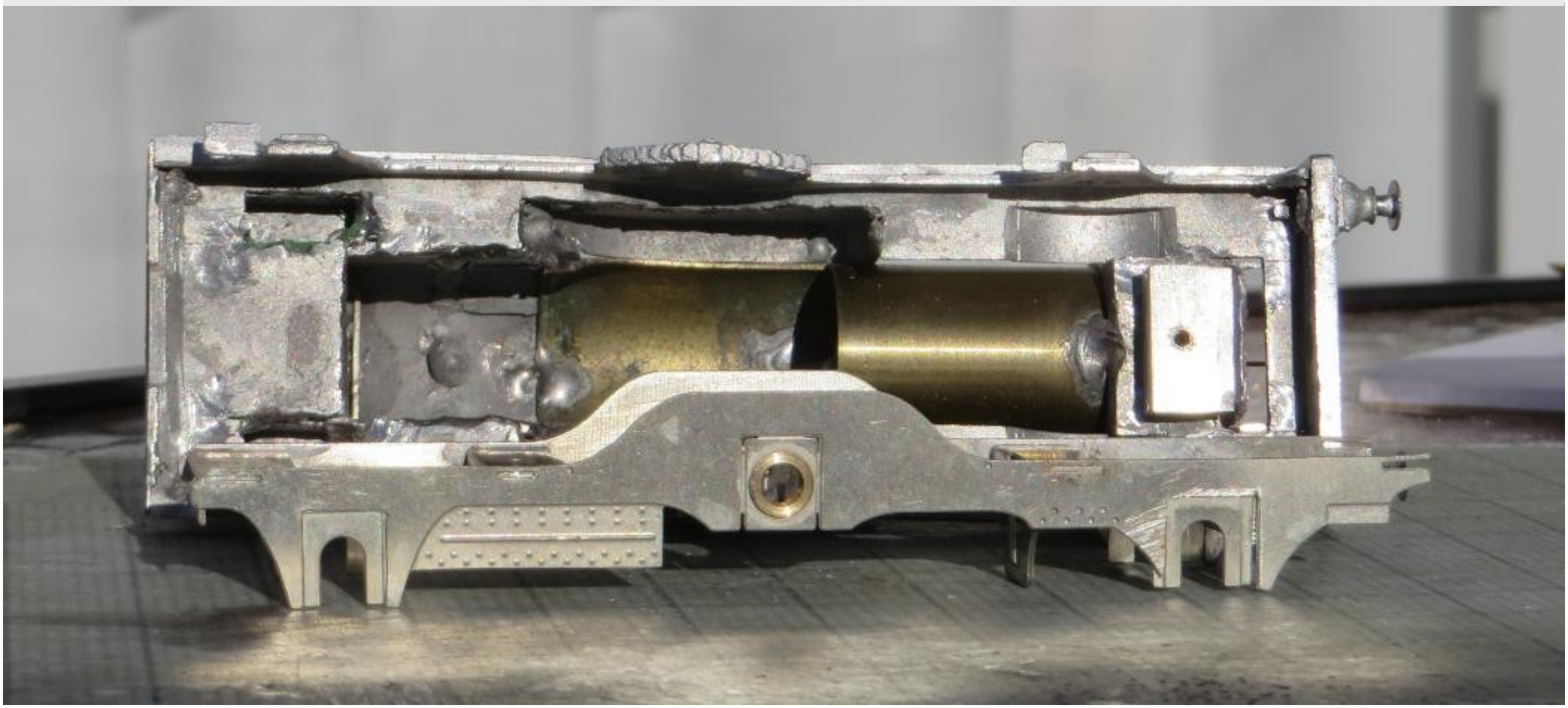
In the last edition of the Digest, I posed a question about the best way to weight and balance a single driver loco. The question was not entirely academic, as I had been asked by 5&9 Models (Chris Cox) to complete the trial build of his prototype whitemetal cast kit for the Nasmyth Wilson series of singles that were delivered to the Brighton in 1867. This article therefore tackles both the kit itself and also the approach that I have taken in this instance to applying weight in the right places.

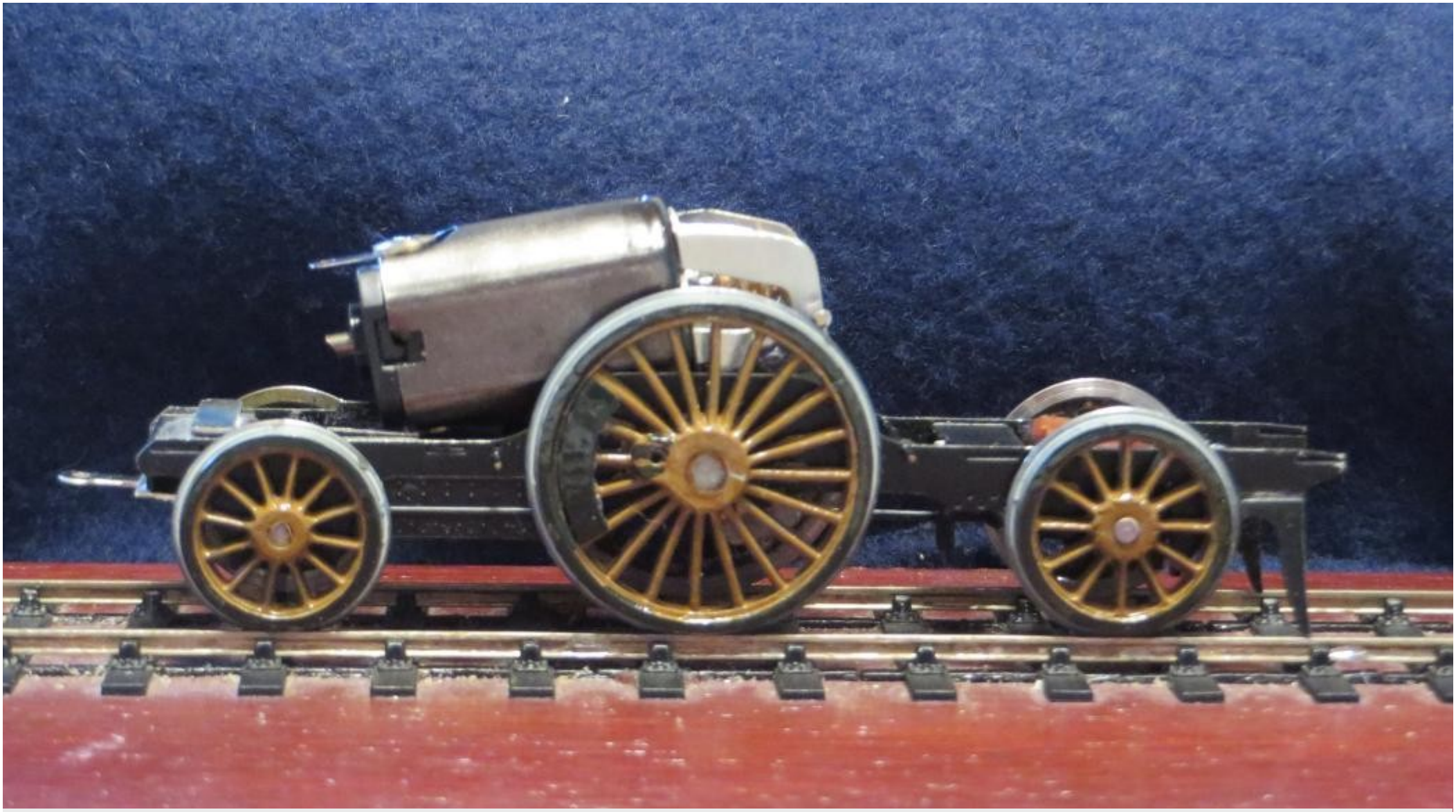


Firstly, the kit itself arrived with the main body assembly already soldered together.

My contribution has been to build the chassis and to finish the body, including detailing, painting and lining. I have also had the fun of writing the instructions as I went along. The chassis has been supplied by EBM (Mike Waldron) and is a direct evolution from that provided with the kit for the Stephenson singles. The running gear is built using a Mashima 1424 flat can motor, with a 68:1 gearbox from HighLevel, which are a snug fit in the firebox and rear of the boiler.

Chassis shown aligned to the undersurface of the body. The design of the chassis is closely based on that for the EBM Stephenson single.



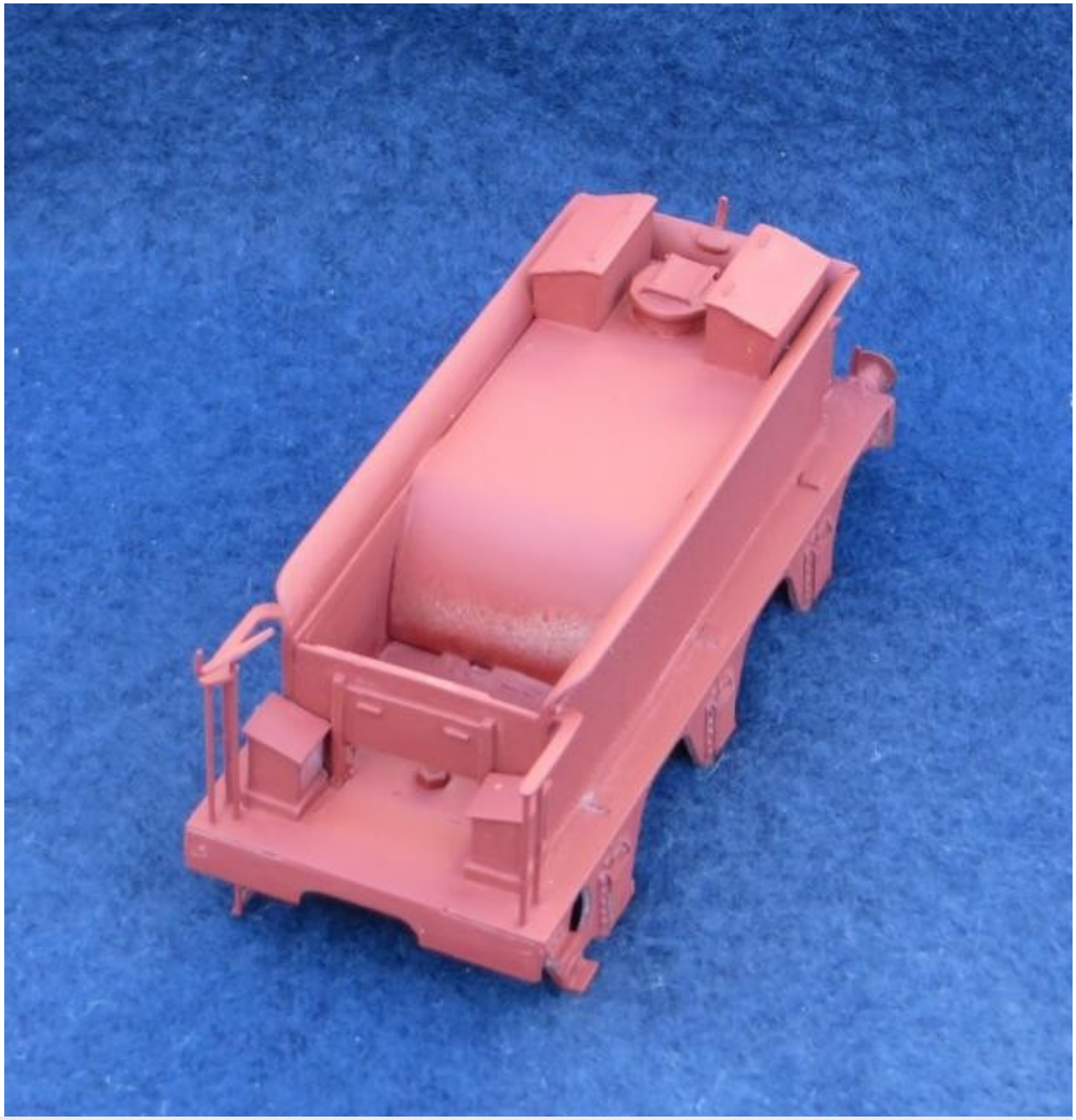


Chassis assembled with the Mashima 1424 motor and the HighLevel gearbox. The chassis is sprayed before the wheels are added and the wheels are painted before assembly onto the axles. This requires some touching up subsequently but seems to be the easiest way to proceed.

The whitemetal construction means that there is plenty of mass to the loco, which provides a good starting point for adhesion. The challenge of whitemetal is that it is more difficult to find anchor points for bolting the body to the chassis. Fortunately, the smokebox front and wingplates are a brass etch and the section below the footplate, at the rear of the cylinder covers, provides a nice brass surface to which an anchor point, and a captive nut can be soldered. The same etch also provides the mounting for three of the four front lamp brackets, so that only one involves soldering to whitemetal.

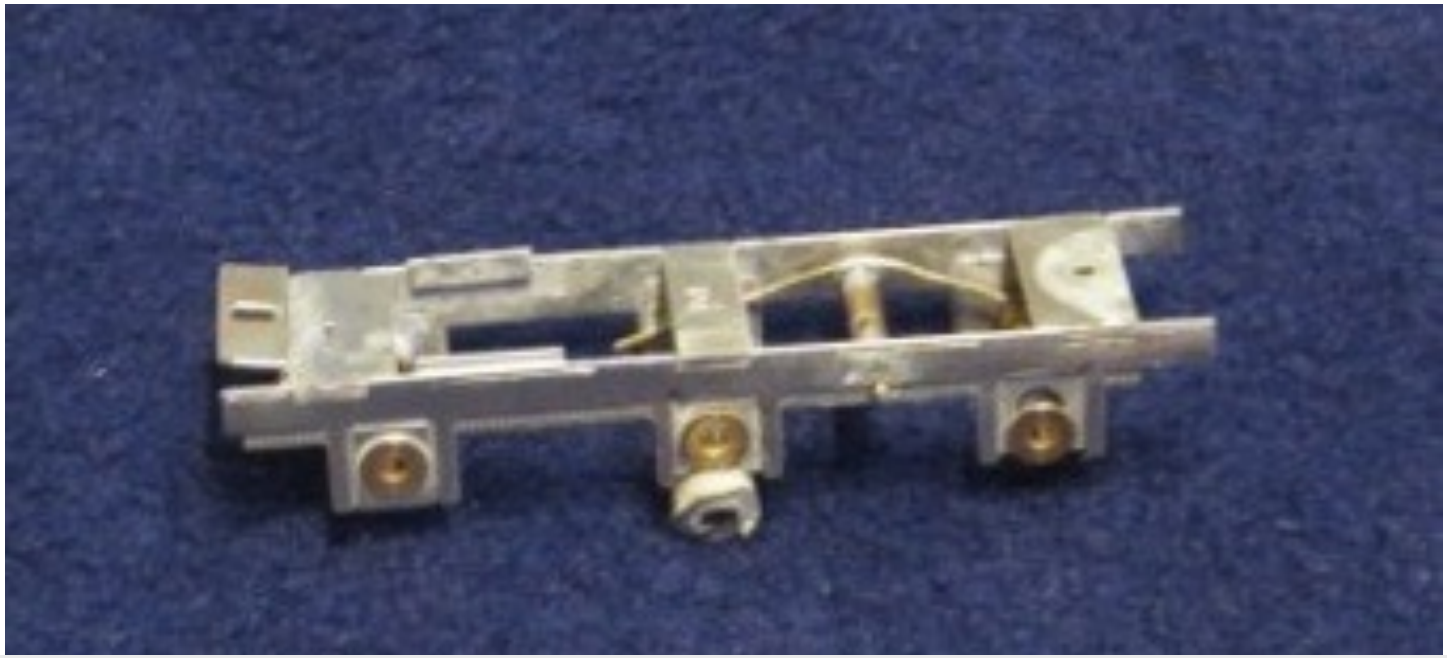

Painted and lined, although the handrails have not been attached, nor has the coupling between loco and tender been fitted. The  detail paintwork is still to be applied to the pipework, brakes, tender handrails, valve cover, etc.

The second aspect that arose in assembly was my plan to explore how to improve the adhesion of a single driver. As already noted, the whitemetal body is a good start and additional lead has been added where possible in the boiler and smokebox. However, I was keen to try the Sharman style “semi-trailer” arrangement for the tender to bear on the rear of the loco. The loco itself has fixed driving wheels and a rocking leading axle to provide the basic three point suspension; this arrangement means that the front end can be filled with weight. The trailing axle is lightly sprung, using guitar string as recommended for Alex Jackson couplings, which should keep it on the track, but take no more weight than absolutely necessary. However, additional weight is applied to the rear of the loco through the tender.



The tender body is mostly cast whitemetal, although the tender top and coalspace are made from a piece of brass. Red oxide primer has been applied - hence the Hogwart’s livery!

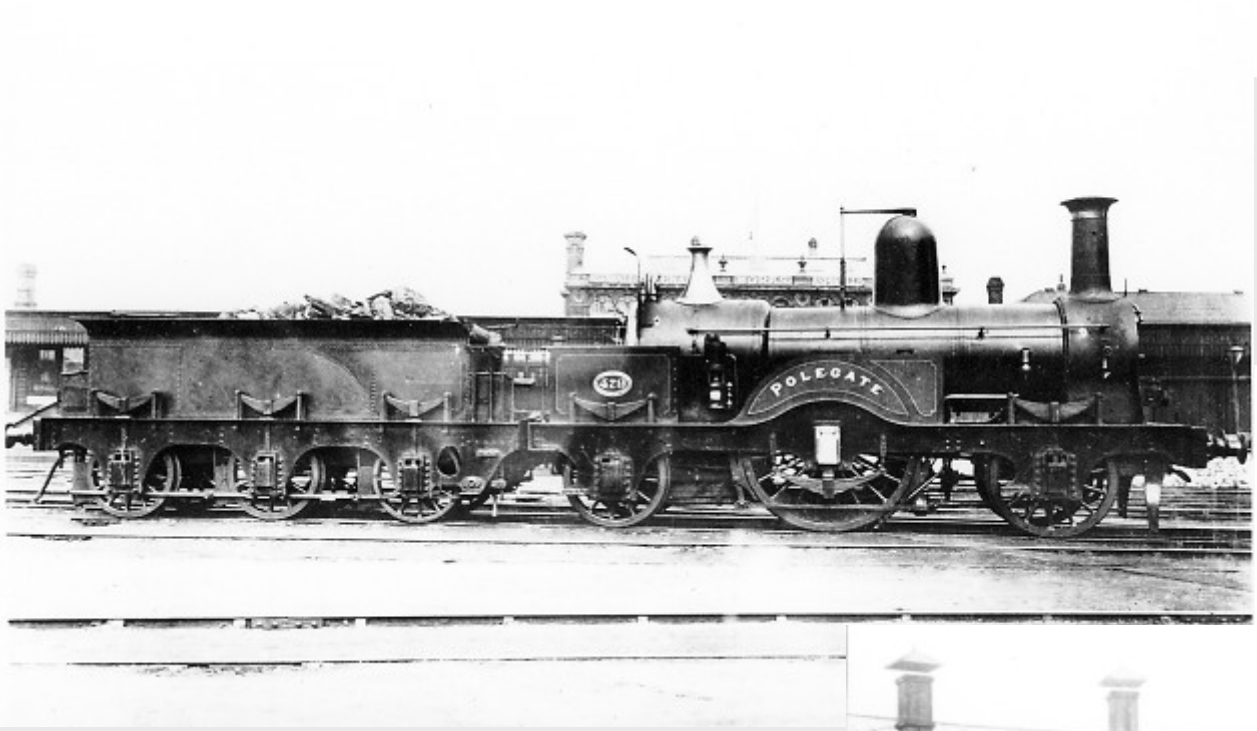
The leading and centre tender axles are linked on a pair of compensating beams, which are loosely fitted to the cross bar from which they are suspended. This provides a small degree of vertical freedom, while the axles themselves have a small lead muff to weight them down since they are not carrying the weight of the tender. A fall plate is soldered to the front of the tender and rests on the rear of the loco footplate (the reverse of prototype practice) so that the weight of the front half of the tender, which is also whitemetal, is transferred to the rear of the loco. A drawbar that transferred this weight to the area near the driving axle would be more elegant, but I concluded that using the fall plate was much simpler! This arrangement can now be used to counterbalance the mass at the front.



Not the greatest photo, but an attempt to show the suspension mechanism. The rear axle, to the left, is fixed, with the bearing soldered into the frame. The centre and right hand axles have double beam compensation, with a slightly loose fit between the cross member and the bearings to which the beams are attached.

The livery has been reproduced with the enamel paints that Mike Waldron recently commissioned for the main, Stroudley colours. For all other colours, I prefer to use acrylic paint, Games Workshop (you need to get over some of the names), Vallejo or similar. Acrylic goes on top of enamel quite happily and MicroMatt acrylic varnish gives a very nice slightly satin finish. I also like to add a tiny bit of “weathering” to make the loco look as though it is in traffic; a slightly sooty mist on top of the boiler and a dusty one on the wheels and frames.

The end result is a rather handsome loco, that would have served throughout the Stroudley period and provides an interesting complement to the Stephenson single.




Postscript - always find a photo of the prototype!

Spot the differences.

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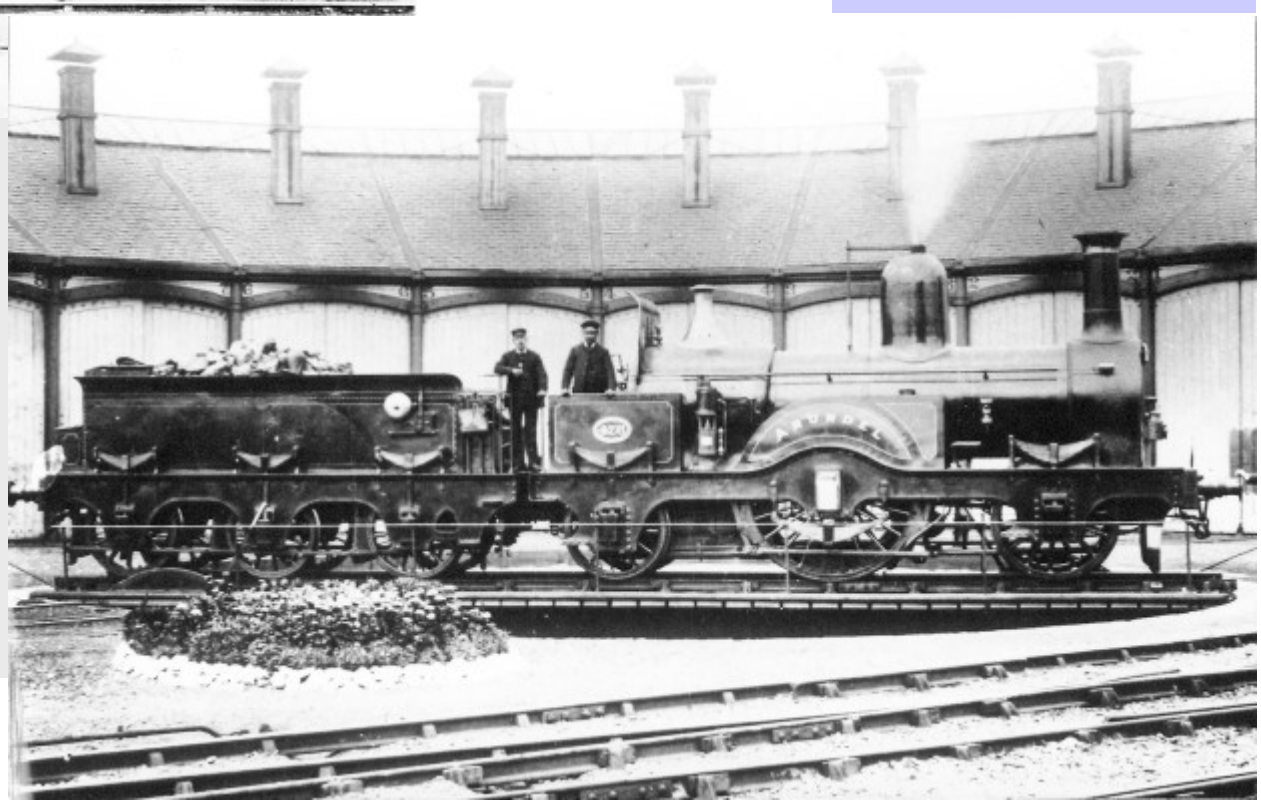
Although both members of the class of 6 locos delivered by Nasmyth Wilson, I suspect that Arundel has had a replacement boiler at some time. Note the different location of the boiler feeds and the lubricators. Other members of the class that appear in photographs appear to resemble Polegate.



# Trains from photos

## by Ian MacCormac

I have spent a goodly amount of time over the last 45 years looking at photographs of LB&SCR trains, as I expect many of us have! I have been modelling all that time as well, firstly in 4mm scale and latterly in 7mm scale. Although there has been quite a lot of trade support in 4mm, I was always wanting to replicate some trains in photos that needed carriages not available from kits. Whilst upgrading CAD/CAM facilities at the secondary school where I taught, I managed to sell to Roger Chivers some of the more antique parts and in a deal, I taught him the basics of using the machine and he taught me the rudiments of etching. He has gone on to produce some beautiful injection moulding tools using that equipment firstly and subsequent more up to date and larger machines. I fiddled about and produced a few etches of things I wanted and over the years I have produced 29 different carriage etches, some of which were made available on a very ad hoc basis to other members of the Brighton Circle.

After cateract surgery, some illness and a few other life changing events, I am now retired and getting well again. As a consequence I started to look at etching again and my various missives over the years are on a blog to be seen at http://ianmaccormacmodels.blogspot.co.uk/

I have gradually moved over to 7mm modelling and have found I needed to make my own etches of many carriages, if I was going to be able to eventually get anything running that resembled some of the photographs. In the meantime, I had been delving at Kew and York and had photographed a large number of GA's and other documents. Ian White, Simon Turner and Sheina

Foulkes excellent books have arrived also and combining everything together has meant that I have so far been researching and producing etches for the following range of coaches:

Craven Type 8B 2nd/3rd, Type 8D 2nd/3rd, Type 9A 2nd, Type 9C Bk 2nd, Type 12F 6 wheel 1st, Type 13A 1st, Type 13F 1st, Type 15B 2nd, Type 15F 3rd, Type 15J Bk 3rd as well as sides for all other Type 15 brake 3rd vehicles, Type 20D Birdcage & Ducket Passenger Brake Van.

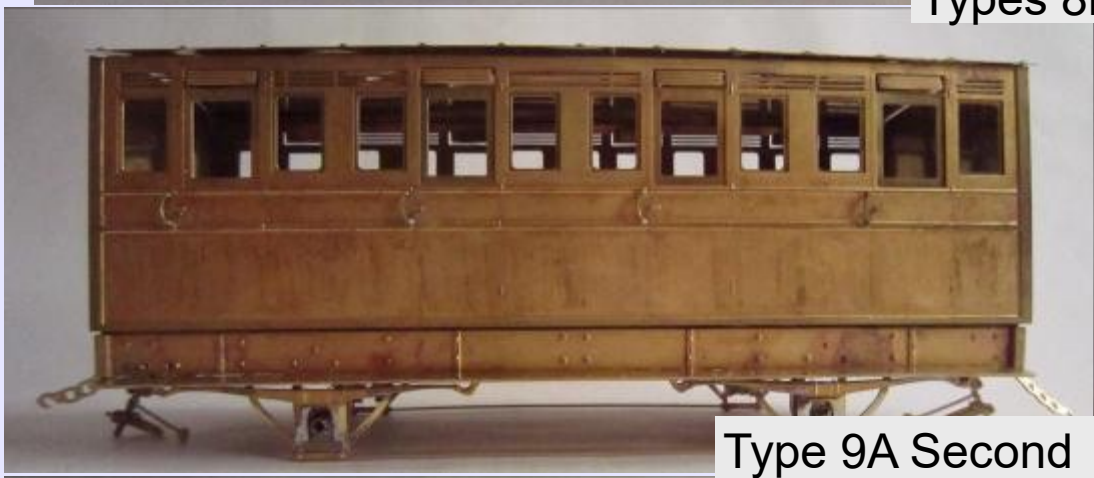
I am starting on some Stroudley vehicles now; Dia 18 a 6wheel 1st Saloon, Dia 23 a 4 wheel 2nd Saloon, Dia 33 early open 3rd, Dia 40 Bk 1st 1 compartment.

I have produced etches for all these so far as well as working on some Pullman Carriages and locomotives, more of which at a later date.

The availability of material keeps on growing and I am teaching myself about 3D Cad so as to be able to produce some masters for casting as well as possibly for complex roof shapes. I shall hopefully be able to report further in the next edition as well as having finally completed and painted some of my own etches!

Type 20 Brake van

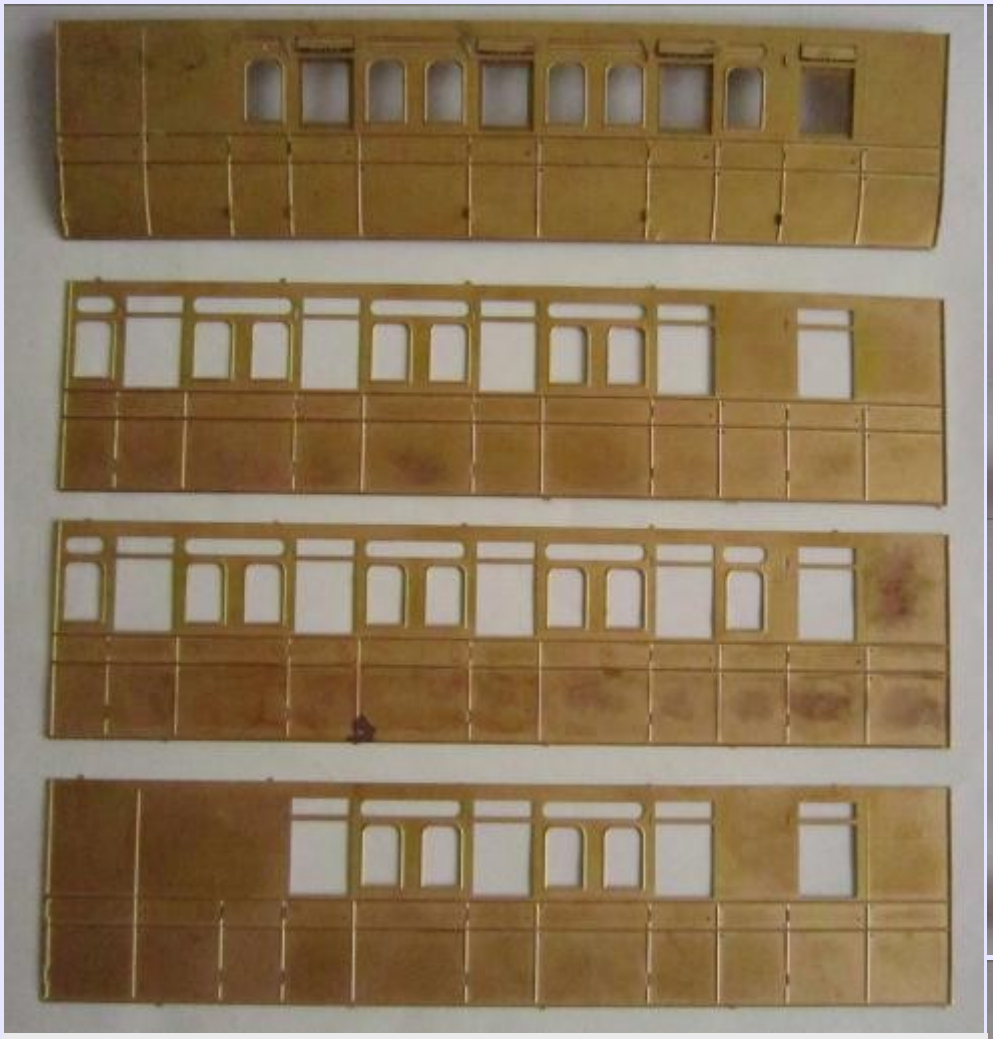
Types 8B and D



Type 9A Second

Firsts 13A above, 13F below

Type 12F 6 wheeled First



Group 15 carriages

Above Brake variations

Top right 15B Second

Centre 15F Third

Bottom 15J Brake/3rd

Stroudley vehicles

Top left Diagram 18 First saloon

Centre Diagram 23 Second saloon

Bottom Diagram 33 Third

Top right Diagram 40 1 compartment Brake/First

7mm

The 7mm carriage etches that are available at the moment are:

Type 8B or D (from the same etch), Type 9c Brake 2nd, Type 15B 2nd/1st, Type 15F 3rd, Type 15J Bk 3rd - all as etches only for £55 each.

Other Type 15 sides as per photo £12.50 each set.

Type 20D Birdcage & Ducket Passenger Brake etch £70

Type 13A 1st £45 etch.

Postage and packing ranges from £4 to £9 depending on how many are ordered.

Next in 7mm will be Dia 18 6 wheel 1st Saloon, Dia 23 2nd Saloon, Dia 33 early open 3rd, Dia 40 Bk 1st 1 comp't, Type 9A 2nd, Type 13F 1st.

I am also in the process of making masters for all the other parts needed to be able to sell these as kits rather than etches. The aim is to have these ready for the AGM this year.

4mm

I have been asked to make the Stroudley Dia 33, 23 and 18 available in 4mm and am working towards this with people sharing the cost of the tooling, as I don't personally want any more in 4mm.

Also available in 4mm now are the Type 15 selection of etches – enough etches for one of each type plus any two of the brake carriages for £130. P&P £5.

The Type 20D is available as a kit including castings and P&P for £54

Progress is shown on Ian's blog at http://ianmaccormacmodels.blogspot.com.es/

Contact via email: ianmaccormac@hotmail.com

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# 4mm scale Craven carriages

## from 5 & 9 Models

Type 2A First

Type 3D Luggage 2nd

5&9 Models Pricelist - May 2017

**Cast whitemetal model railway kits in 4mm scale.** *Wheels and couplings not included.*

| London & Brighton Rly Carriages (1840s) | Price £ | London & Croydon Railway Carriage | Price £ | LB&SCR Carriages (1840s – 1860s) | Price £ |
|---|---|---|---|---|---|
| 1st Class double ended coupe *(type 1a)* | 15.00 | London & Croydon composite | n.y.a. | Late 1840s open third | 15.00 |
| 1st Class double coupe saloon *(type 1d)* | n.y.a | *(Later SER Duke of Wellington carriage)* | | 1850s open sided third | 15.00 |
| 1st Class single coupe saloon *(type 1e)* | n.y.a | | | 1850s second | 15.00 |
| 1st Class three compartment *(type 2)* | 15.00 | | | 1860 family luggage saloon | 15.00 |
| 2nd Class open sided coupe brake *(type 3a)* | 15.00 | | | 1863 composite luggage | 15.00 |
| 2nd class two comp. luggage *(type 3d)* | 15.00 | | | 1863 composite brake slip coach | 15.00 |
| *3rd Class open *(type 4a)* | 15.00 | | | 1866 four compartment second | 15.00 |
| *2nd Class three comp. open sided *(type 4b)* | 15.00 | | | 1866 five compartment third | 15.00 |
| *2nd Class three comp. enclosed *(type 4c)* | 15.00 | | | 1866 luggage brake third | 15.00 |
| Parliamentary *(Woodham Wagon Works)* | n.y.a | | | 1860s Carriage Truck *(Woodham Wagon Works)* | 13.00 |
| ** Please note: These are all the same kit. The different types depend on how you choose to build them.* | | | | 1850s Horse Box *(Woodham Wagon Works)* | n.y.a. |

| LB&SCR Goods wagons | Price £ | LB&SCR Goods vans | Price £ | LB&SCR Brake vans | Price £ |
|---|---|---|---|---|---|
| Stroudley open A *(Woodham Wagon Works)* | 13.00 | Stroudley 8 ton van Diag. 8 | 13.00 | 6 wheel ballast brake | 15.00 |
| Stroudley open D *(Woodham Wagon Works)* | 13.00 | Billinton 8 ton van Diag. 8 | 13.00 | Craven No.93 brake | 15.00 |
| Billinton open B 3 plank | 13.00 | Poultry van Diag. 8 | 13.00 | Ex. Passenger lantern brake | 15.00 |
| Billinton open 6 plank Diag.6 | 13.00 | Craven goods van | 15.00 | 1851 goods bk. *(Woodham Wagon* | 15.00 |
| 15 ton ballast wagon | 13.00 | Craven outside framed goods van | 15.00 | Craven passenger lantern brake *(Woodham Wagon Works)* | 15.00 |
| Early single plank open | 10.00 | C. C. Williams 1850 cattle truck | 15.00 | **Private Owner Wagons** | |
| 1851 dumb buffered coke wagon | 13.00 | Billinton special cattle truck Diag. | 15.00 | 'Lamont & Warne' coal | 13.00 |
| 1851 coal wagon | 13.00 | Stroudley covered carriage truck | 15.00 | 'Cory' end door coal | 13.00 |
| 1866 dumb buffered coal wagon | 13.00 | Low roof Grande Vitesse van | 15.00 | 'Bradfords' Eastbourne coal | 13.00 |
| 6 wheel 25 ton machinery truck | 13.00 | High roof Grande Vitesse van | 15.00 | 'Rickett Smith' coal | 13.00 |
| | | | | 'George Giles' goods | 13.00 |
| | | | | 'Spenser Whatley & Underhill' goods | 13.00 |
| | | | | 'T. S. & C. Parry' (N. London Rly) x2 | 25.00 |
| | | | | *A very limited number of transfers are available for the above wagons at £2.50 per wagon. Please enquire for availability. No Cory, Rickett Smith or Lamont & Warne.* | |

| Carriage fittings | Price £ |
|---|---|
| 1850/60s axleboxes (Craven) x 12 | 2.50 |
| 1870s axleboxes (Stroudley) x 12 | 2.50 |
| 1880/90s axleboxes (Billinton) x 12 | 2.50 |
| 1900s axleboxes (Panter) x 12 | 2.50 |
| 6ft springs x 12 | 2.50 |
| 7ft springs x 12 | 2.50 |
| 8ft springs x 12 | 2.50 |
| 6ft spring & Stroudley axlebox x 12 | 4.00 |
| 7ft spring & Stroudley axlebox x 12 | 4.00 |
| 7ft spring & Billinton axlebox x 12 | 4.00 |
| 8ft spring & Billinton axlebox x 12 | 4.00 |
| 1840/50s coach buffers (horsehair) x | 3.00 |
| 1850/60s coach buffers (fluted) x 12 | 3.00 |
| Stroudley coach buffers | 3.00 |
| 'J' type spring hangers x 12 | 2.50 |
| Square base oil lamp pots x 12 | 2.50 |
| Round base oil lamp pots x 12 | 2.50 |
| Gas lamp tops x 12 | 2.50 |
| Westinghouse brake cylinder x 2 | 2.00 |

| Loco and tender fittings | Price £ |
|---|---|
| Craven/Stroudley loco buffers x 12 | 2.50 |
| Smokebox door long hinges | 1.25 |
| Smokebox door short hinges | 1.25 |
| Boiler backhead *(waisted)* & | 2.00 |
| Boiler backhead B1 & regulator | 2.00 |
| Early loco backhead & regulator | 2.00 |
| Westinghouse pump x 2 | 1.50 |
| Screw reverser | 1.25 |
| Lever reverser | 1.25 |
| Sandboxes (pair) below footplate | 1.50 |
| Sandboxes (pair) above footplate | 1.50 |
| Vacuum brake pipes x 12 | 2.50 |
| Dome (Stroudley) 8mm x 8mm | 1.50 |
| Dome (large) | 2.00 |
| Craven lamps *(glass lenses)* x 12 | 5.00 |
| Stroudley lamps *(glass lenses)* x 12 | 5.00 |
| Stroudley chimney 14.5mm tall | 1.50 |
| Tender domes *(1 large & 1 small)* | 1.50 |
| Tender communication bell r/h | 1.50 |
| Stroudley tender filler | 1.00 |
| Craven tender filler | 1.00 |
| Tank loco fillers x 2 | 1.50 |
| Craven tender toolboxes x 2 | 1.50 |
| Early dumb buffers x 12 | 2.50 |

| Wagon & Van castings | Price £ |
|---|---|
| Craven/Stroudley axleboxes x 12 | 2.50 |
| Single wooden brake shoe and lever x 2 | 2.50 |
| Brake van stove chimney x 2 | 0.50 |
| Self contained buffers x 12 | 2.50 |
| Tapered buffers x 12 | 2.50 |
| Craven brake van buffers x 12 | 2.50 |
| Billinton van axleboxes x 12 | 2.50 |
| SER wagon axleboxes x 12 | 2.50 |
| LCDR wagon axleboxes x 12 | 2.50 |
| Plain square wagon axleboxes x 12 | 2.50 |
| Double steel brakes for 9'9" w/b | 1.75 |
| Double steel brakes for 9'6" w/b | 1.75 |
| 3ft wagon/van springs x 12 | 2.50 |
| 4ft wagon/van springs x 12 | 2.50 |
| Craven brake van lantern look-out | 2.00 |

| Victorian figures | Price £ | | Price £ | | Platform & Architectural castings | Price £ |
|---|---|---|---|---|---|---|
| Dickens: Mr Bumble & Oliver Twist | 2.00 | Two seated gents | 2.00 | Stroudley platform mounted water crane | 5.00 |
| Dickens: Bill Sykes & The Artful Dodger | 2.00 | Two seated girls | 2.00 | Every of Lewes wooden canopy pillars x 8 | 10.00 |
| Shoe shine boy and customer | 2.00 | Seated man holding on to hat | 1.00 | London & Croydon Railway Atmospheric Railway Tube x 1 | 1.50 |
| Four standing gents | 4.00 | Two loco crew | 2.00 | | |
| Four standing Ladies | 4.00 | Two policemen | 2.00 | | |
| Seated sleeping man | 1.00 | John Bull | 1.00 | | |
| Seated lady with baby | 1.00 | Seated train conductor (guard) | 1.00 | | |
| Two seated revellers | 2.00 | Porter stepping up | 1.00 | | |
| Orange seller | 1.00 | | | | |

**For illustrations of completed kits please visit the 5&9Models website or visit the 5&9Models gallery on RMWeb where you can keep up with developments by following my blog.**

**Occasionally kits and castings are also made available for sale on eBay under the seller name tiffa*71**

***Kits, castings and figures listed in blue are not yet available but are under development for release in the not too distant future.***

**Please add £3.00 postage and packing on all orders (UK only). Payment by cheque (made out to Chris Cox) or Paypal (preferred), via the email address below. Please allow 10 working days to process orders. All orders are posted first class UK mail. Overseas customers please ask for a postage quote first.**

***No callers without prior arrangement please.***

Chris Cox, 5&9Models, 30 Hodge Bower, Ironbridge, Shropshire, TF8 7QQ

chriscox5and9@gmail.com 07496 161142

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# Brighton Layouts that you may see at Exhibitions

Ferring

East Grinstead see linked website

Plumpton Green see linked website

Hailsham see linked website

Saltdean see linked website

# The Brighton Circle

The Brighton Circle is the Historical Society of the London, Brighton and South Coast Railway (L.B& S.C.R.). It is dedicated to the research and publication of information about the company and it produces a quarterly journal entitled the Brighton Circular.

While the Circle is primarily focussed on railway historical research, there has been an important interaction with preservationists, particularly on the Bluebell Line, and with railway modellers. The Bluebell line provides an important source of original artefacts, which contribute valuable information about the company's practice. Modellers have benefitted by access to data about the physical appearance of the company and its operations and, as a result, members of the Circle have been able to produce scratch builder aids, paint and lettering on a limited run basis, which are made available among other members.

Membership of the Brighton Circle for 2017 is

£18.00 for full membership

Applications should be sent to

The Membership Secretary, Peter Wisdom

peter.wisdom.wisdom@btinternet.com

The Circle is lso in contact with local historians, industrial archaeologists, family historians and other groups whose interests intersect with those of the Circle.

# THE BRIGHTON CIRCLE

An historical society dedicated to the furtherance and publication of original research into the history of the London, Brighton and South Coast Railway

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## MEMBERSHIP APPLICATION FORM

**To the Hon. Secretary, Peter Wisdom, 76 Woodbourne Avenue, Brighton BN1 8EJ**

I hereby apply for membership of the Brighton Circle.

**SIGNED..... DATE.....**

**NAME.....**

**ADDRESS.....**

**.....**

**.....POSTCODE..... (BLOCK CAPITALS PLEASE)**

It would be helpful if you could give some idea of your main interests in the history of the LB&SCR and any special interests. Please indicate if you are a modeller and give any details.

I enclose a cheque/postal order for £19.00/£10.00 to cover the joining fee of £1.00 plus twelve/six months membership of the Brighton Circle for the calendar year 2017 (please delete as necessary).

Cheques should be made payable to **The Brighton Circle.**

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