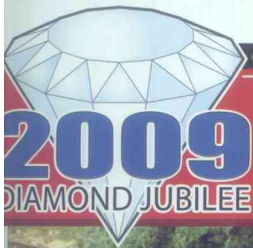


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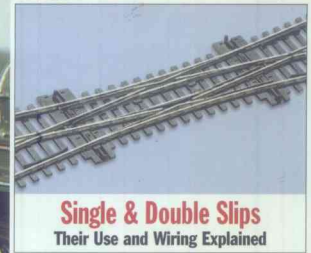
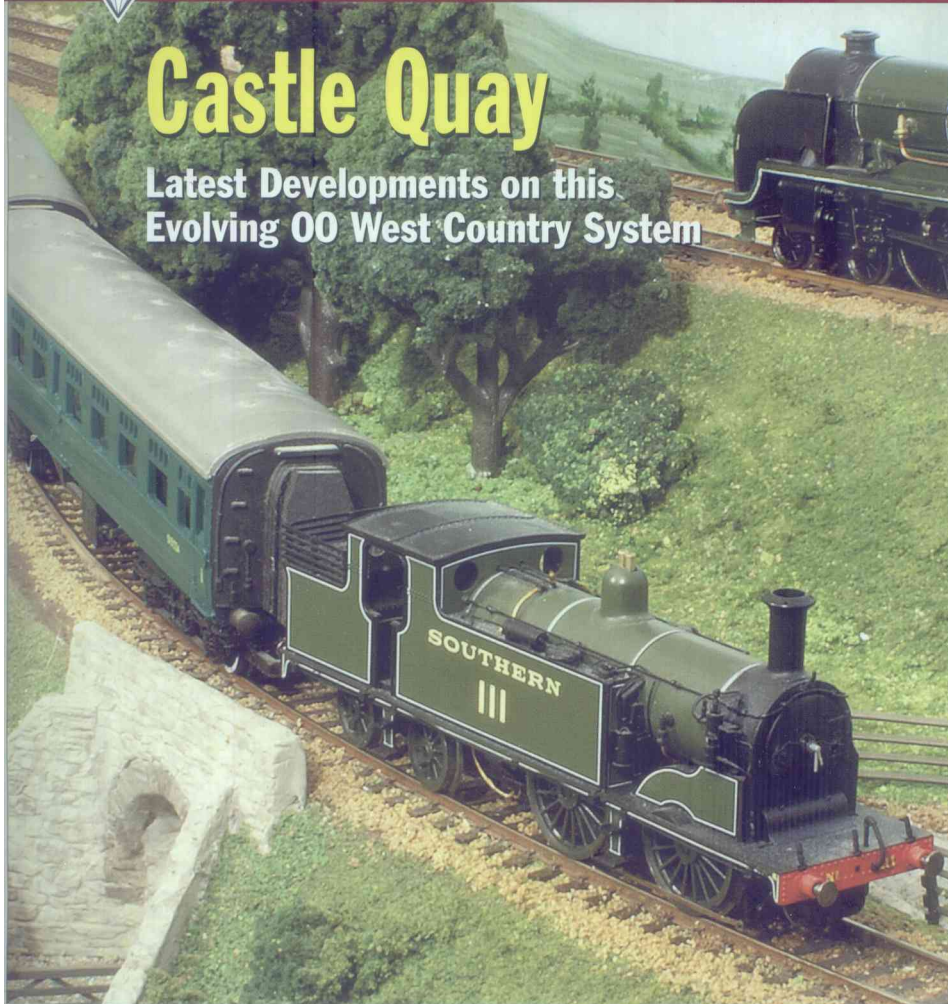


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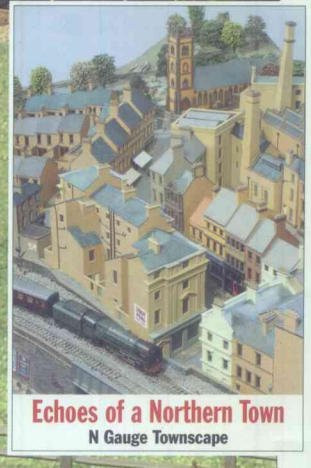


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Beattie well tank in O

Modelled in late working 'Wenford Bridge' condition

FRANCIS SAMISH built this example from the Roxey Mouldings 7mm scale kit; he describes the construction, and gives some soldering hints, here.

Leading a charmed life deep in the fastness of North Cornwall, three archaic 19th century tank engines eked out an uneventful existence until the early 1960s hauling clay, coal, and stone from Wenford Bridge to Wadebridge.

In model form, Westward used to make a whitmetal version in 4mm, and the one-time Jidenco etched brass kit is still listed as being available from Falcon Brassworks. Then there is the O gauge Roxey Mouldings offering, which, in my opinion, is best regarded as accurate only for these engines' 'middle period' – between about 1900 and 1935 or so when the Southern beefed up the front ends of all three as old age and cracks in the frames caught up with them.

The superstructure

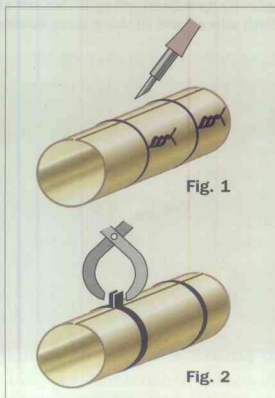
The Roxey kit essentially comprises a whitmetal superstructure on an etched nickel-silver chassis, the 'backbone' to which is a pre-rolled brass boiler. I began construction by following in John Ahern's footsteps by making up a pair of soft iron wire loops tensioned with twisted ends to keep the pre-rolled boiler tubing at the right diameter and degree of parallelism, while my Weller 40 watt iron did the business, assisted by much flux. See Fig. 1.

With the bottom seam secure, the firebox sides – which need to match up to the rear splashers that are part of the cab sidesheets

– can be bent carefully outwards into a shallow reverse curve. Rather than trust to finger pressure for jobs like this, I keep a selection of short steel and brass stubs of varying diameters to hand to act as bending formers.

Boiler bands are easier to fit at this early stage, sliced off from about 5thou brass shim with a Stanley knife and straight edge, and pre-tinned prior to application. To keep them tensioned, I bent each end into an 'L' over which was clamped a 3" pair of forceps. When done, the protruding extra lengths of band were trimmed back nearly flush. See Fig. 2.

For brass on brass, even with a medium-wattage iron as I used, there is little fear that things will unsolder themselves – in fact, more heat is actually better.



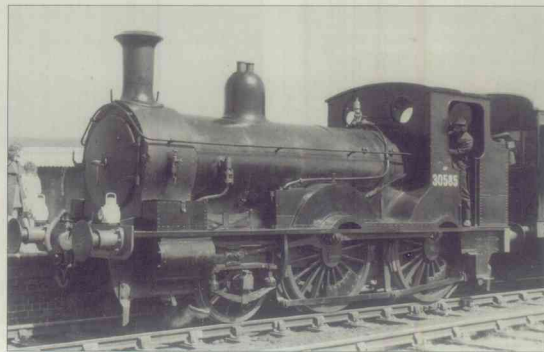
Photographs of the finished model by Jolyon Sargent.

The real things

The three Beattie well tanks which made it into the 20th century were from a class of 85, nearly all of which were built by Beyer, Peacock between 1863 and 1875. They were designed for work on the LSWR suburban lines in the London area; Nos.298, 314 and 329 were sent to the Bodmin & Wenford in the 1890s to replace life-expired motive power on the lightly-laid branch. This, plus the sharp curvature, ensured their survival, much rebuilt, until 1962. Two have been preserved, but No.30586 (ex-329 of 1875) was scrapped at Eastleigh Works in 1964.



▲ No.30585 at Bodmin in 2006 (photograph by the author)...



▲ ...and in 1971, at Quainton Road (photograph: Frank Hornby).

Whitemetal, however, melts at a lower temperature than ordinary solder, and to cap it all is an excellent 'soak-away' of heat.

Because of these characteristics, it can be more difficult to run a clean seam in one go with whitemetal, but the secret in O gauge seems to be to take things slowly and avoid the temptation to press hard in an effort to get better heat transfer from a low-wattage iron. If things don't seem to be going well, try Carr's tip cleaner (by C&L Finescale). Fettling castings beforehand so that they actually touch all the way along a join line is also important, as you don't want the liquid solder dropping through too large a gap and leaving a hollow that needs filling later.

If there is a critical join on the Roxey kit, it is the one between the rear of the firebox and the front weatherboard of the cab. It is best to fix this and the cab sidesheets to the cast footplate first, then move on to trial-fitting the boiler and smokebox. Initially, I tinned all the brass areas carefully beforehand with soft solder, but as things progressed discovered that C&L Finescale 100 degree solder and matching yellow flux would allow me to skip this tinning step, considerably speeding up such 'mixed metal' operations. See photo 1.

Although the metal boiler comes ready drilled for handrail knobs, it does not have holes for the washout plugs – and in any case, some of these are about 1mm or so adrift for the later Drummond rebuild boilers. As I was modelling 30585 in British Railways days, a new hole for a support stanchion had to be drilled on the right-hand side as well. For this reason, I left the smokebox door casting off until quite late in the build, in order to allow a piece of wooden doweling to be poked inside the thin boiler shell, which provides a support when drilling these additional holes. Their position was marked with reference to photographs, and I used a toolmaker's scribing block and surface plate to ensure that everything was parallel to the running plate, although marking out with a scriber and conventional ruler would be suitable too.

As an aside, I find it easier – if rather laborious – to drill such holes in awkward positions with a pin vice, after first making a shallow indentation with an old

dart head as a centre-punch substitute.

Comparing images of the Beatties in their various states from both the Middleton Press *Wenford Bridge to Fowey* album, and Bradley's *LSWR Locomotives – The Early Engines*, it becomes clear that after the 1930 rebuilding, buffer heights were raised; the additional platework added to the front subtly changed the appearance of these locomotives.

Front buffer beam

Because of the need for mechanical strength on the buffer beam, I made up a new one from brass sheet, with a carefully-filed section of square section material soldered to the rear that incorporated the same end profile as the original Roxey footplate casting.

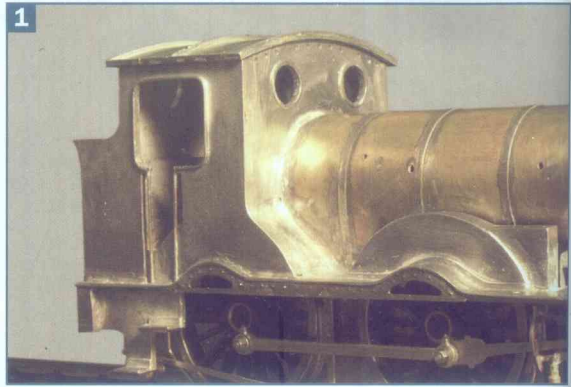
Underneath, two triangular bracing pieces were fixed, better for coping with buffing and drawbar forces. The whole assembly, including Slater's buffer stocks, new buffer heads (photo 2), lamp irons and Laurie Griffin Miniatures' vacuum pipe casting was soft-soldered up as a unit, and then carefully grafted onto the footplate with Carr's 100° solder.

The chassis

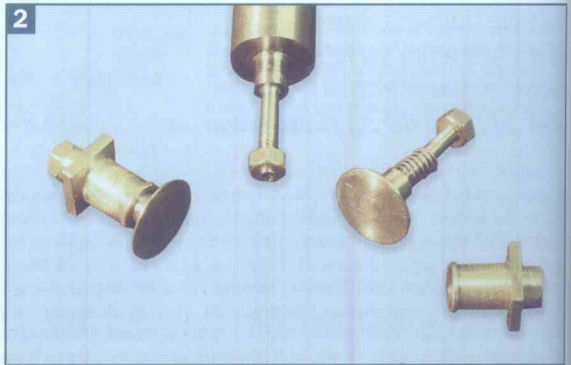
The chassis needed the same degree of attention, in the form of replica flitch plates soldered on to the sides – again with the forceps as a quick clamping tool – and finished off with stubby guard irons. I find it easier to finish these off once they are on the model, bending to sit the right distance for the chosen gauge, and finishing off with a fine Swiss file so as to leave about 1mm clearance from the railhead.

Wheels for the well tank are from Slater's, which come on squared axles and require the addition of balance weights, which Roxey provides as etchings on the chassis fret. I used ordinary superglue to fit these – but first taking the precaution of lightly sanding the spokes underneath beforehand, and the back of the etched parts, so as to provide a good key for the adhesive. See photo 3.

Getting a chassis running sweetly, I find, is always a matter of repeated assembly and disassembly. I usually start with the motor and gearbox in accordance with the instructions, then work towards erecting the chassis frames, adding two or three strategically-located tapped plates for



1 ▲ The critical joint between the rear of the firebox and the front of the cab. *Constructional photographs by the author.*



2 ▲ New buffer heads to replace those supplied with the Slater's fittings were turned on a lathe.



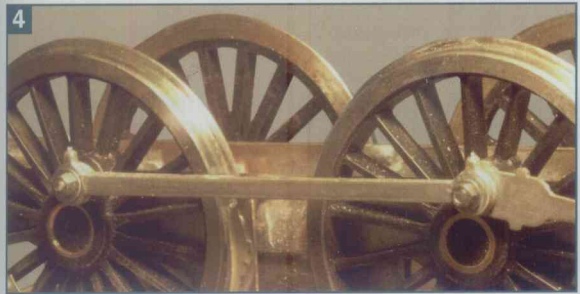
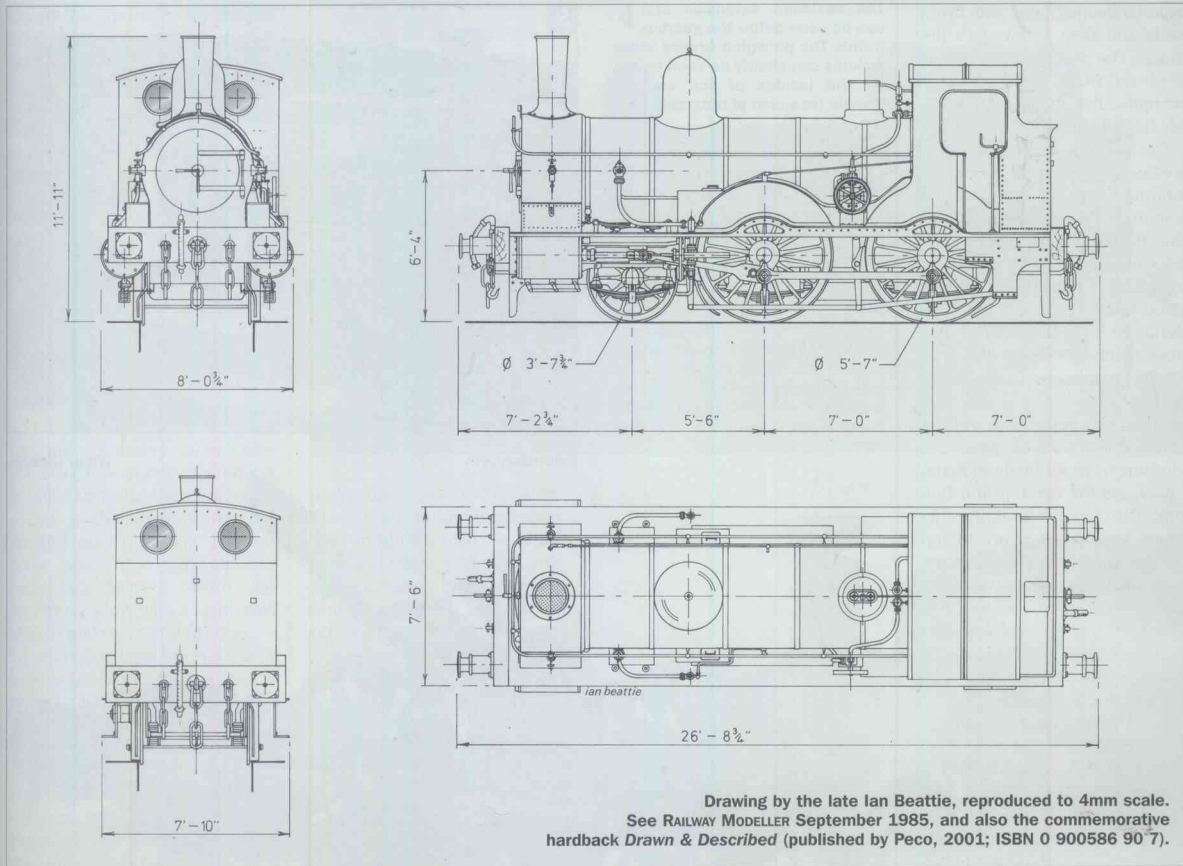
3 ▲ The coupled wheels' balance weights were fixed using superglue. Both wheel and etching were sanded to give the glue a key.

current collectors and suchlike. Even on a simple four-coupled rigid chassis such as this, coupling rods will need easing for tight spots – I scratch 'R' and 'L' on their insides, so they can go back on the same way as they come off. See photo 4.

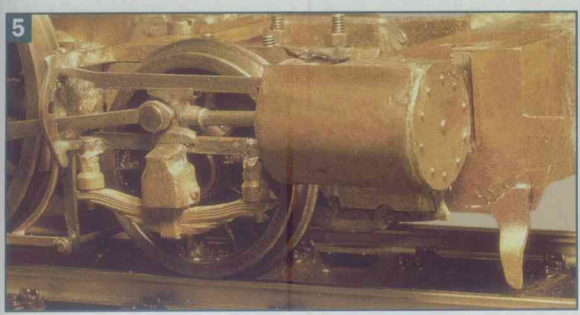
Outside cylinders and slidebars (see photo 5) are assembled onto a removable stretcher that sits in notches made in the top of the frame. I am fortunate enough to possess a small lathe, so the rear cylinder covers were turned up out of scrap brass rod, with

replacement fabricated steel strip slidebars forced into small holes and then soldered up solid.

On these locomotives the outside springs are fixed to the slidebars, and on the prototype are paired by another set of inside springs, just visible underneath the boiler between the front splashers and smokebox. I used some Laurie Griffin Miniatures castings, slightly modified, which after painting had their axleboxes polished up back to their native brass. The leading wheels are in fact sprung, the Roxey etched



4 ▲ Coupling rods in place; in order to identify them during chassis adjustment they are marked lightly on the rear.



5 ▲ The cylinders and slidebars; they were assembled onto a removable stretcher, just visible at the top of the photograph.

axle carrier being made to work with a nest of four Kadee truck (bogie) coil springs working around 8BA double-nutted bolts. A bit tricky to assemble but worth it, as if built rigid, a 2-4-0 chassis will always be lacking in adhesion. See photographs 6 & 7.

Pickups and motor

The Beattie has wiper pickups from phosphor bronze – actually the same material as Roxey supplies for the kit's boiler bands. See photo 8, overleaf. It is wonderfully soft springy stuff, and was soldered to copper-clad sleeper



6 ▲ To ensure good adhesion, the leading axle is sprung using a quartet of Kadee coil springs. These push down upon a plate to which the axle is fixed, as seen in photograph 7.



7

material, gapped, fitted with flying leads and then screwed to the chassis. The pickups were bent to touch the wheel rim, and at just the right curve so as not to be visible from the side.

The Mashima 1933 motor has a flywheel, in quest of smoother running, and to combat any potential dirty track problems. This sits in a modified gearbox, fitted with an extension arm with an eye at its end which was soldered to one side, and led back along the chassis to the nearest cross-member. A screw was then put through the eye in the extension arm into a matching tapped hole in the frame. Two rubber cushions – punched from old windscreen wiper blade material – pack out the eye top and bottom. The key to making this arrangement work is not to nip up the screw tight and lock everything solid. As it is, the gearbox is free to float – cushioning drive take-up from rest, and helping to cut down noise. The eye and the extension arm can also be seen in photograph 8.

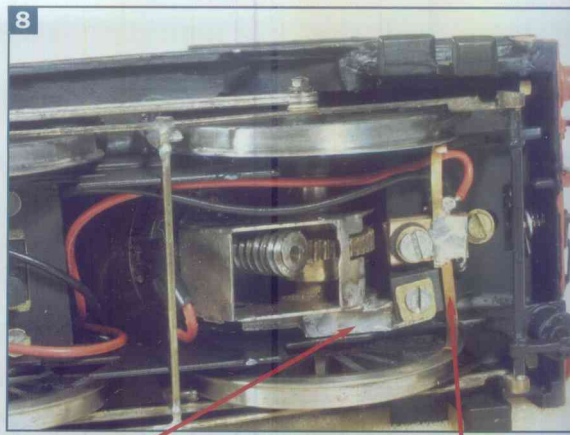
Finishing off

Detail work did not start in earnest until the basic body had been fitted to the chassis and the underside given clearance for wheels and flanges with a rotary burr in the mini-drill. It is surprising just how much has sometimes to be removed to ensure that no intermittent short circuits occur.

The cushioned extension arm can be seen below the gearbox frame. The phosphor bronze wiper pickups can clearly be seen acting on the insides of the coupled wheels (see also photograph 7).

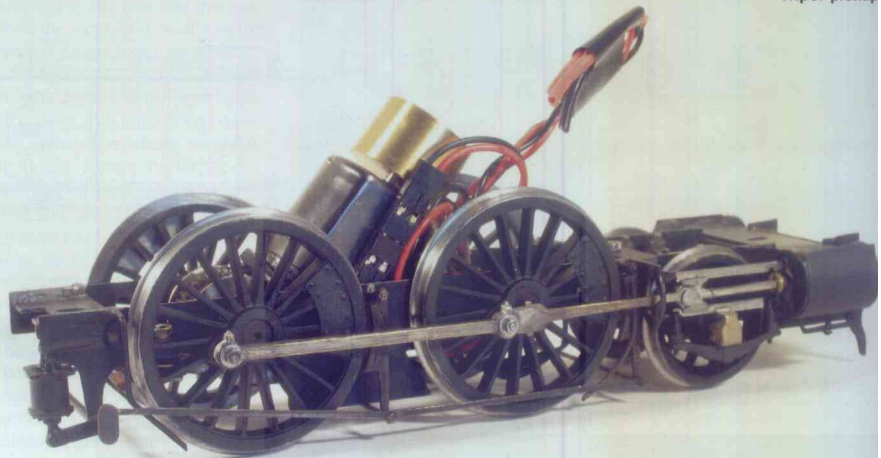
Careful rotation of the wheels by hand with the worm wheel grub-screw slackened off will usually leave tell-tale marks where material needs to be removed, and I often do this several times to

The chassis in all its glory. The wire loom top right is for connecting a DCC decoder, whilst next to the motor can be seen a sub-miniature connector, which isolates the motor for maintenance purposes.



Extension arm

Wiper pickup



allow for any slop in the chassis to superstructure fixing screw holes.

At this stage, I was getting a bit fed up with having to go around with a small scraper – I grind these up from old warding files – after each soldering session.

◀ Beattie 2-4-0WT No.30587 captured by the camera at Boscombe Junction in July 1955. This was the site of a small yard at the end of the Wenford Bridge line; trains could either run to Wadebridge – the direction in which the photographer was looking – or reverse towards Bodmin General. The branch to the Southern Railway terminus – Bodmin North – diverged from the Wenford Bridge route at Dunmere Junction, not far from the other end of the yard. Built by Beyer, Peacock in June 1874, the locomotive was withdrawn in December 1962; it has been restored for use on the Bodmin & Wenford Railway.

Photograph: the late Les Pickering, courtesy Bob Brown.

Lowmelt solder is in my experience harder than the metal it bonds when cold, making it difficult to control the scraper as you move from hard to soft material. So for the dome, smokebox door, chimney, and the rear guard irons, I ultimately used Loctite 330 Multi-bond adhesive – an industrial grade agent that has a very high shear resistance.

Painting, as befits a goods engine, is plain black over two coats of primer, both out of aerosol cans. As always, the final coat showed up the usual flaws and hollows, and these were filled with cellulose car stopper and then rubbed down with fine wet and dry emery paper. Once you use car stopper on a model, it is imperative that only oil-based paints such as Humbrol are applied over it. Luckily I found some black that matched the 'tally-black' finish from the can, and by stippling with a brush was able to make everything good.

Lettering is from the Fox water-slide range. Good as these are, in order to get the carrier film to be almost completely invisible, I make sure that the area where they are to be applied first has a coat of gloss varnish. A spray coat – again from an aerosol – of Humbrol matt varnish then goes over the lot as a finish and sealer, misted over rather than aimed directly at the locomotive. This gives a far less toylike image, and one that I like to think brings a hand-built model into the same class as one produced by Hornby or Bachmann.

It only remained to add the turned brass spectacle surrounds complete with their Perspex 'glass' inserts – I look at these now and again and still think they should be a bit thinner – and



make up a set of fire irons. These seem to be quite prominent in all the pictures of the Beatties in their workaday garb, and are merely brass wire with ends hammered flat for the prickers, and a piece of shim stock beaten over a former for the ash shovel. Number and shed plates are from Severn Mill Nameplates – I admit to baulking at trying to paint the 72F Wadebridge shed code white – and have little shim 'tails' soldered to their rears to secure them better against being inadvertently rubbed off.

Conclusion

So there she is, not a museum standard model of 30585 by any means, but one that I hope captures some of the character of a prototype that fortunately is still with us.



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