This article was published in the Gauge 0 Guild Gazette *Vol. 18 No. 1. The photographs used to illustrate the article have been omitted because they can be found elsewhere on this site.*

A Splendid Monster

Nick Baines

That is how the contemporary writer and engineer D. Kinnear Clark described the largest Crampton engine ever to run on a British railway. *Liverpool* was built for the LNWR in 1848, supposedly to demonstrate that Gooch's big engines on the Great Western could be matched in size and power by a standard gauge engine. It had the classic Crampton features: a single driving axle behind the firebox, double frames, and valves driven from outside eccentrics. Locating the driving axle at the rear meant that the size of the boiler was not limited by the spacing between the wheels. The boiler was, by the standards of the time, huge, so much so, that the builders evidently decided that an extra pair of carrying wheels was necessary under the boiler, giving it a very unusual 6-2-0 wheel arrangement. Unfortunately, putting the driving axle at the rear meant that it carried only a fraction of the engine weight, which must have limited the traction. Whether because of this, or its reputation for spreading the lightly-laid track of the time, its service life was only ten years, and most of that time seems to have been spent in storage. In spite of that, it has attracted considerable interest from railway historians. For those interested, there is a recent article on *Liverpool* in the *L&NWR Society Journal*, Vol. 6, No. 1 (June 2009).

I was very pleased to be asked to make a model of *Liverpool*. There is a lot in the prototype to interest me as a model builder. The outside Stephenson's valve gear driven by a pair of huge eccentrics is so obvious that it just has to be modelled correctly. The driving wheels themselves, eight feet in diameter, are striking, and there is that odd collection of leading and carrying wheels. The two front axles have wheels of different diameters, and the centre wheels are flangeless. The outside frames with all their rivets and bolts are also obvious features.

It is not apparent in the side elevation, but the boiler is not circular. In pursuit of the largest possible boiler, the designers made it is egg-shaped, being formed of two semicircles (or almost semicircles), the upper of larger diameter than the lower, joined together. The firebox too is an odd shape, waisted to fit between the driving wheels, then expanding at the front end where it meets the boiler. Internally the loco is most interesting to the engineer, but thankfully irrelevant to the modeller, with a huge number of narrow boiler tubes, a split firebox, and a type of thermic siphon, the last of these dating almost a century before Mr. Bullied fitted them to his Pacifics.

Altogether it represented something quite out of the ordinary, and the model required a lot of thought and planning. Conventional ideas about a separate chassis and body, the way model locos are usually made, went out straight away. There is not really a footplate at which to split the model at all. The final solution involves a number of subassemblies, bolted together. The 'backbone' of the locomotive is the inner frames, spacers, buffer beam, and drag beam. The outer frames and cylinders are attached to this. Other subassemblies comprise the piston rods and slidebars, and the valve gear. The smokebox and boiler together and the firebox are two more subassemblies that bolt directly to the inner frame assembly. The final major component is the driving wheel splashers and the footplate between them.

The construction of the model thus resembles that of the prototype to a much greater extent than is usual. Using subassemblies in this way does require a certain forethought, and of course there are holes to be drilled and tapped to take the bolts that hold everything together. In spite of that, I did find that it facilitated the construction, being able to remove and to a limited extent realign parts at will. I guess that it also makes the painting easier, although thankfully that task was handed over to Ian Rathbone, a man far more expert than me in that department.

I won't go into a full account of the construction, but some notes may be of interest. The model is almost entirely scratch built, including the driving wheels. Of course nobody makes an eight-foot diameter, eighteen-spoke wheel with extended boss for mounting the eccentrics, so there was nothing for it but to do it myself. The wheel centres are machined from brass, and fitted with steel tyres. The remaining wheels are Slater's, and probably do not have quite the right spoke profile, but they can hardly be seen.

The easiest part of the construction was the motor and gearbox. I gave Brian Clapperton, otherwise known as ABC Gears, a copy of the prototype drawing on which I had marked up the space in which they had to fit. The motor is in the firebox, then the drive has to go through the ash pan, underneath the footplate, and upwards to meet the driving axle. Brian quickly confirmed that nothing in his standard range would fit such an odd locomotive, but offered to make me a special gearbox, which he did at a

very reasonable price. Job done – I did not even have to calculate the gear ratio, Brian did that for me too.

Yes, the driving wheels do slip on starting unless you are very careful with the throttle. I crammed weight into the firebox where I could, and weighted the tender which rests on the drawbar and transfers some weight to the engine, but there is a limit to what can be done. It will pull several of the lightweight carriages of the period, which is probably all the prototype managed, and the sight of those eccentrics in action is not to be missed. Ian's finishing is quite special, in the painting and lining, and the extensive copper-plating of the firebox and steam pipes, but his photos speak for themselves.