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Virginia Modifications

This document was written by Geoff King and was originally published by The Colchester Society of Model and Experimental Engineers in Spring 2019. As most of you know, I have built several locomotives over the last 40 years or so. As an engineer employed in a Colchester factory in various positions, you get aware of what works and what is not workable. If something goes wrong, you fix it. If it goes wrong again, you look at the design to see if there are any faults and if it goes wrong a third time it needs a re-design and an upgrade of materials etc.

When making my Virginia a lot of thought was made as the building progressed. There were no real problems until the boiler was being made. It was realised that the design of the firebox made access to the upper boiler stays difficult to silver solder. LBSC had designed a firebox with a narrow grate area due to the bar frames taking up a lot of room and with a large space above the grate for combustion to take place. It would be difficult to reach into the firebox with a flame to solder the stays. (See sketch 1 on page 6)

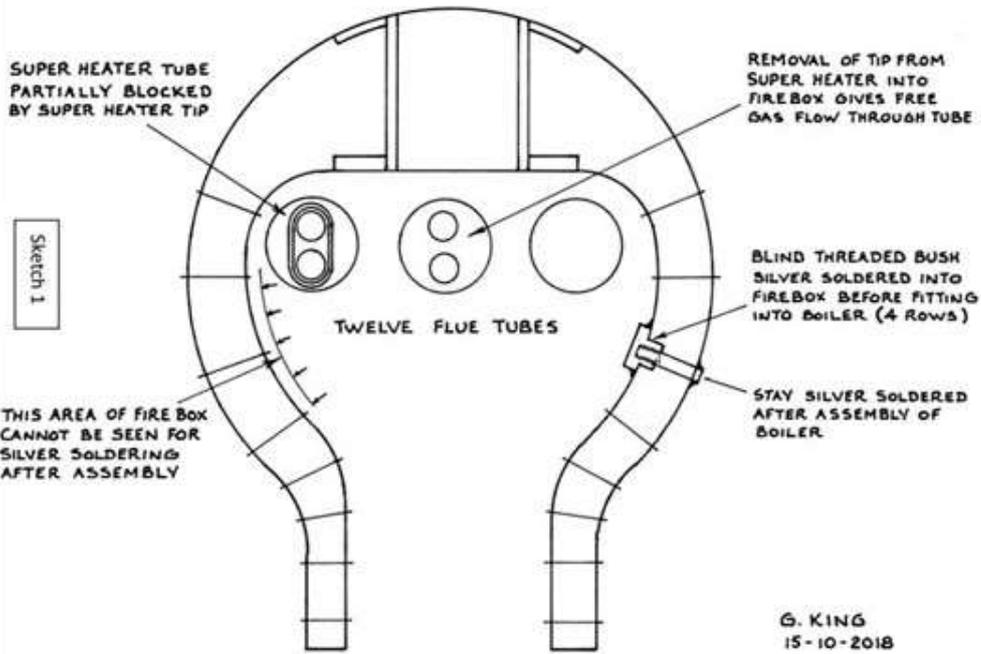
After a lot of thinking I came up with a design which I discussed with Alex Walford, who was the chief boiler inspector at the time. I would silver solder into the upper parts of the firebox rows of threaded blind bushes for the stays to be screwed into after the firebox was fitted into the boiler. When assembled the stays in the upper area of the boiler could be screwed into the firebox from the outside and then soldered on the outside only.

This has been a complete success. There have been no problems now for 1660 miles since completing the locomotive in 1980.

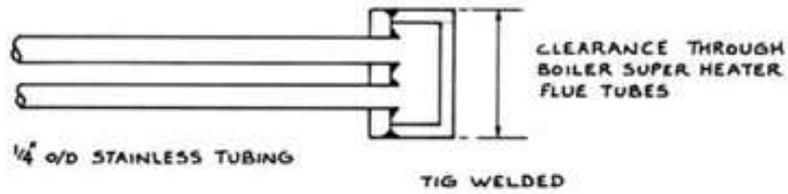
After many miles running I realised the super heater had failed, there being a blow up the chimney and out of the firebox door when the regulator was opened. The super heater was removed from the boiler, where it was found that the front tip of the super heater had worn away. It appeared that grit from the fire had eroded away the copper as it passed at high speed down the boiler tube.

A new stainless steel super heater was made to a radiant design in the firebox, which I had TIG welded. There was an unexpected result when I started to run the locomotive, as steaming was much better for a much longer period. The bottom rows of the boiler tubes no longer became blocked up with cinders from the fire. This was put down to having a much clearer space around the super heater, as the tip of the super heater no longer blocked the gas flow through the boiler. All of my latter loco's now use this design of super heater which reaches almost to the firebox door. (See sketch 2 on page 6)

Another mod that I have made is on the hand pump in the tender. After several years use I became aware that the piston ram was becoming rather loose in its bore. I realised that the weight of my hand was pushing the piston downwards, causing wear to take place in the bore of the pump. The pump body was extended by some 2 inches so that the pump piston was supported throughout its length. A slot was machined along the body for the pump handle to work the piston, while it was supported for the entire stroke. I have not had to touch the hand pump now for several years.



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15-10-2018



MATERIAL: HEAT RESISTANT STAINLESS SUPER HEATER TUBE FROM BLACKGATES
ALL MY LOCO'S USE THIS DESIGN OF SUPER HEATER

Sketch 2

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