

## ‘S&DJR Avonside 0-4-4T No.31; Adding the Last Details’.

By Steve Duckworth

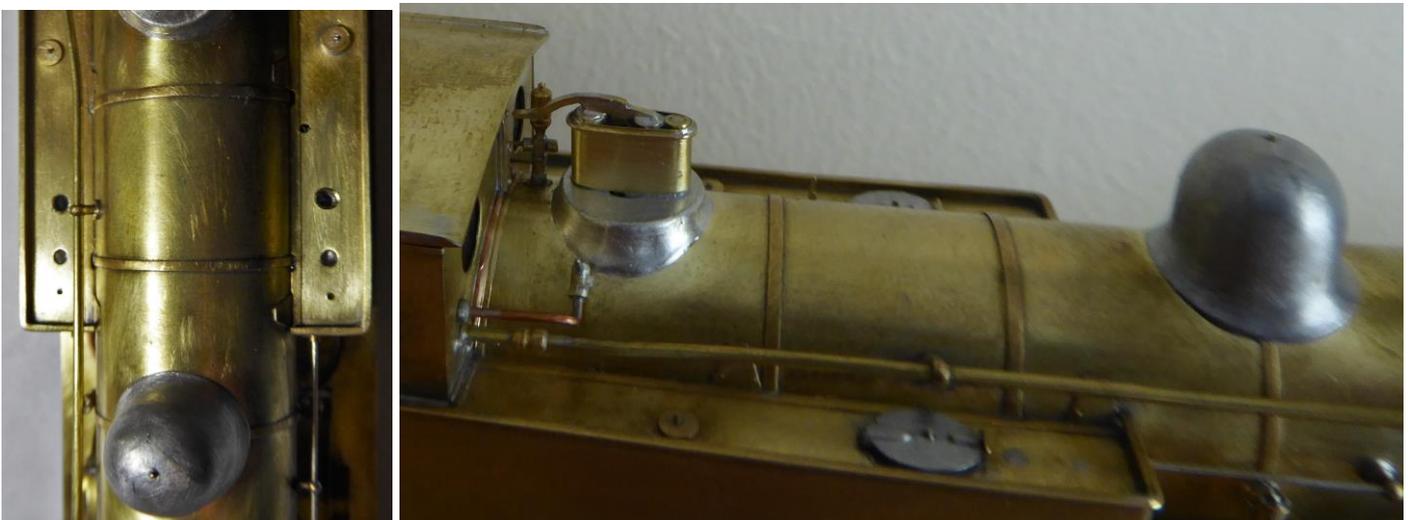
In addition to my separate contribution to ‘Virtual Missenden Spring 2021’, featuring two sprung 4-4-0 chassis builds, I am taking this opportunity to ‘wrap up’ my Autumn 2020 feature, concerning the detailing work on my SDJR 0-4-4T No.31. It now only remains to complete the cab fittings, and I shall do this in parallel with the cabs on my 4-4-0 pair, in due course. So here we go, I hope you will find something useful to yourself.....

### Tank filler re-positioning, without tears.....



We start with a backwards step. The JM kit’s neat cast tank fillers had been soldered into the holes etched at the front of the tank tops, and it was only later that I realised I had made an error when I described their position, in my earlier contribution to the October Virtual Missenden. This position certainly applied to the later Vulcan 0-4-4Ts, but some Avonsides, at least, had their fillers set further back, as shown in Tom Lindsay’s drawing - and No.31 did! Photos suggest that *earlier* Avonside examples may have used the forward location; there *does* seem to be a handle here in some photos. A mystery, for now.....

Re-positioning the filler was made simpler by the use of my newly-acquired resistance soldering iron, see centre image, above. With the model placed on a foil-covered base, and an insulated scalpel at the ready, application of the probe on a low setting soon had the solder softened and the lid freed, without damage. In this and the next photo, the hinges of the upturned castings lie roughly where the holes should have been for No.31.



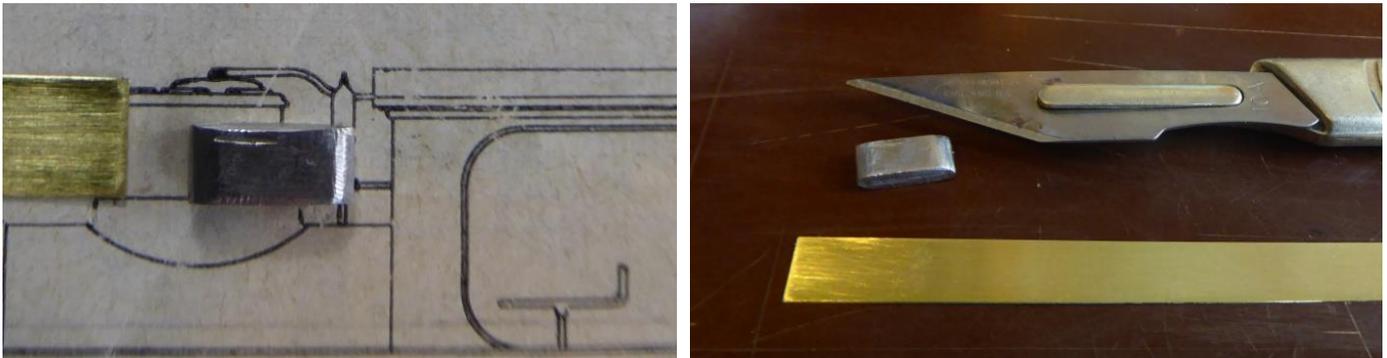
On the left, the new tank filler positioning holes have been drilled, but the redundant forward holes remain to be solder-filled. On the right, the filler lids are re-positioned and the redundant holes solder-filled and fettled. There will probably be a need for some more fettling after priming, to get a fully flush surface.

### Fire iron bracket and stanchion



As so often, photographs were invaluable in showing the form and siting of these features. The bracket was fashioned from narrow Palatine Models' nickel silver strip, and the stanchion was chosen from my store of long handrail knobs. Positioning had to be by eye, relative to adjacent features, since neither the Avonside nor Vulcan drawings depicted these items.

### Safety Valves & Cover

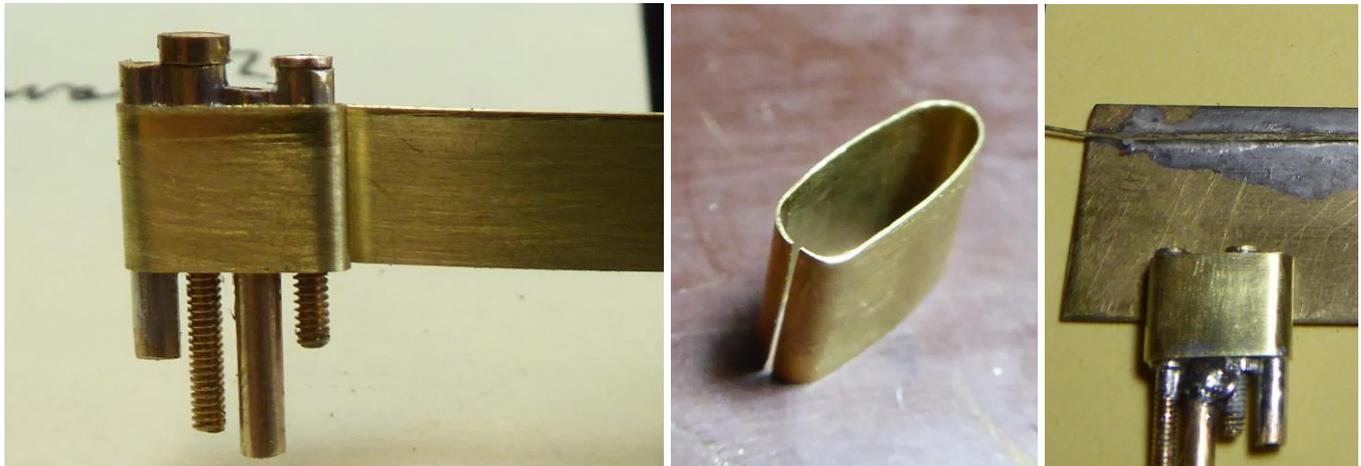


The Ramsbottom and lock-up safety valves on the Avonside fireboxes were enclosed in a brass casing. The kit's whitmetal casting was too tall, too thin and lacked the convex profile seen in photos, so a scratch-build was necessary. I did toy with wrapping a reduced-height casting in brass shim and adding detail, but did not proceed very far.



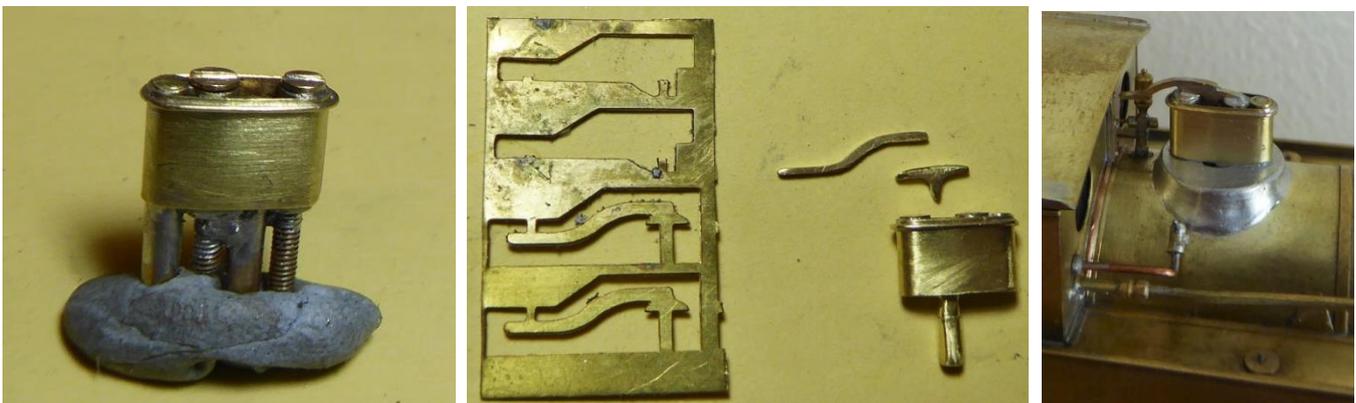
Study of photos suggested that the actual valve top detail could best be rendered using brass tubing, capped by brass screws with their heads filed back. This semi-prototype arrangement could then be

wrapped in a brass shim casing. Above, left, is a trial arrangement, placed adjacent to the cast safety valve base. The order of the different-sized tubes is, from the cab: small lock-up valve, Ramsbottom valve, spacer tube to carry the lever's spring, Ramsbottom valve. In reality this sequence should be reversed - the lock-up valve should be at the front. Centre; the four tubes, cut over-long for ease of handling, are aligned using Tufnol blocks, ready to be flooded with 222deg solder. On the right are the assembled tubes, the part-formed brass shim casing and two 12BA screws, one of which has had its head filed down.



On the left, the shim casing is being finally formed to a close fit; I did not need to anneal it. At the centre, the convex profile has been introduced, by inserting a drill shank of greater diameter than the valve tubes, then easing it to-and-fro over the centre part of the casing. The rear joint closure has then been finalised.

On the right, the casing and 'the innards' have been assembled, held firmly with a wooden clothes peg, using 188deg solder. In the background, a length of 0.5mm brass wire has been soldered 145deg to a brass slab and filed down to a 'D' cross section, to form the rim of the casing.

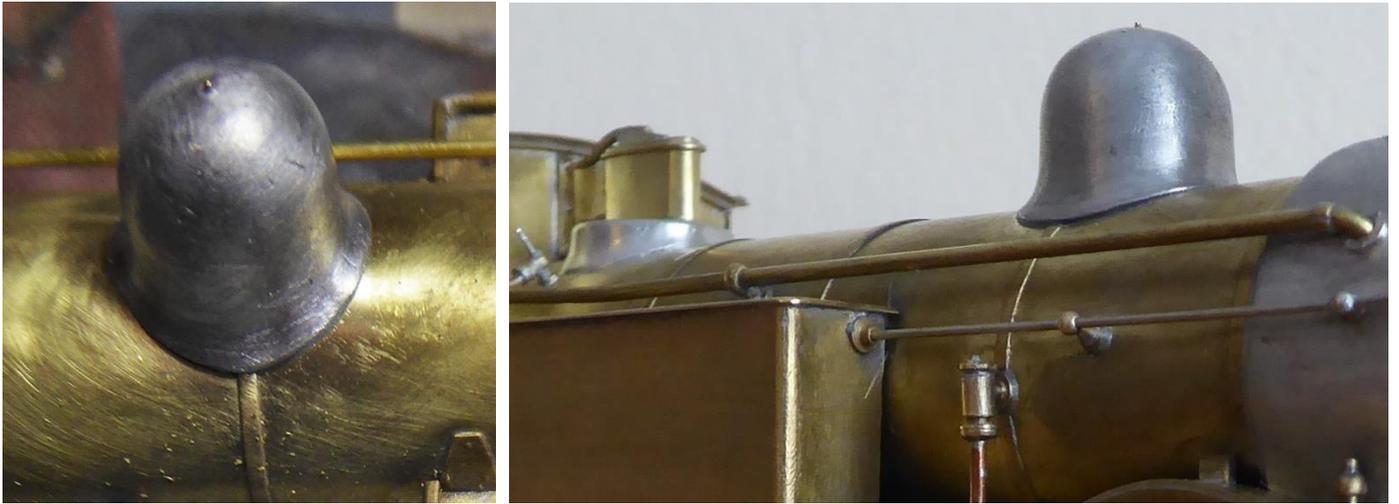


The rim was formed around the assembled casing, then the end curves were *further* formed to tighter curves using round-nosed pliers, so that when trimmed the rim would 'grip' the casing when being adjusted. This made it easier to achieve a rapid soldering-on, using 145deg solder, without loosening the previous soldered assemblage.

At the centre, a kit etch (*anonymous, sorry*) for Ramsbottom levers provided the components for a re-working, to complete the safety valves. Note that the lock-up valve is now correctly at the front. Surplus tube/screw-thread has been trimmed back leaving a single locating stalk - unfortunately it is off-centre. I had to enlarge the locating hole in the cast base, during which I rather strayed over-width, as seen here. Some filler work will be needed. The foreground pipework still awaits its miniscule stop-cock....

This final assembly stage caused some grief, lengthy and intense use of assertive language, and a final sense of relief. Hard graft, but I think it captures the prototype rather well.

## Dome



The kit offering for the plain dome was too narrow and too tapered, so I had to search through my large stash of spare kit domes before I found one that approached the correct, full-bodied profile for the Avonside. Further time was spent refining the profile, then a hole was drilled and a 0.4mm brass wire 'fixing bolt' added at the top; I am hoping that the latter refinement will help draw the eye away from a too-large gap around the base - even after considerable filing and rubbing-down of the latter. I am not fully convinced, yet..... but will 'go away and come back afresh'.

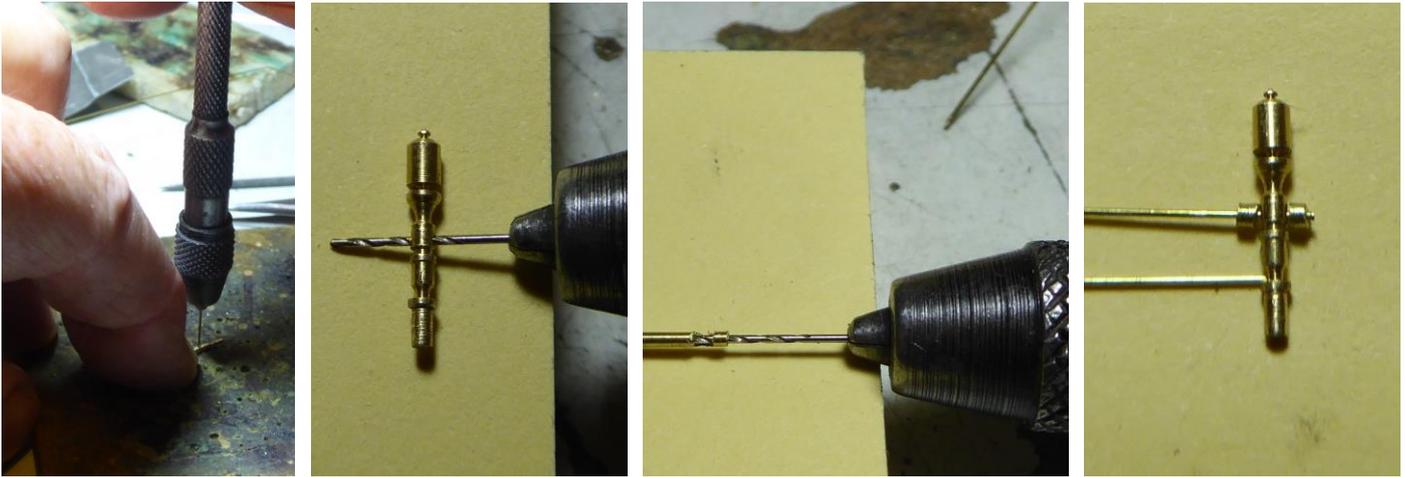
## Chimney



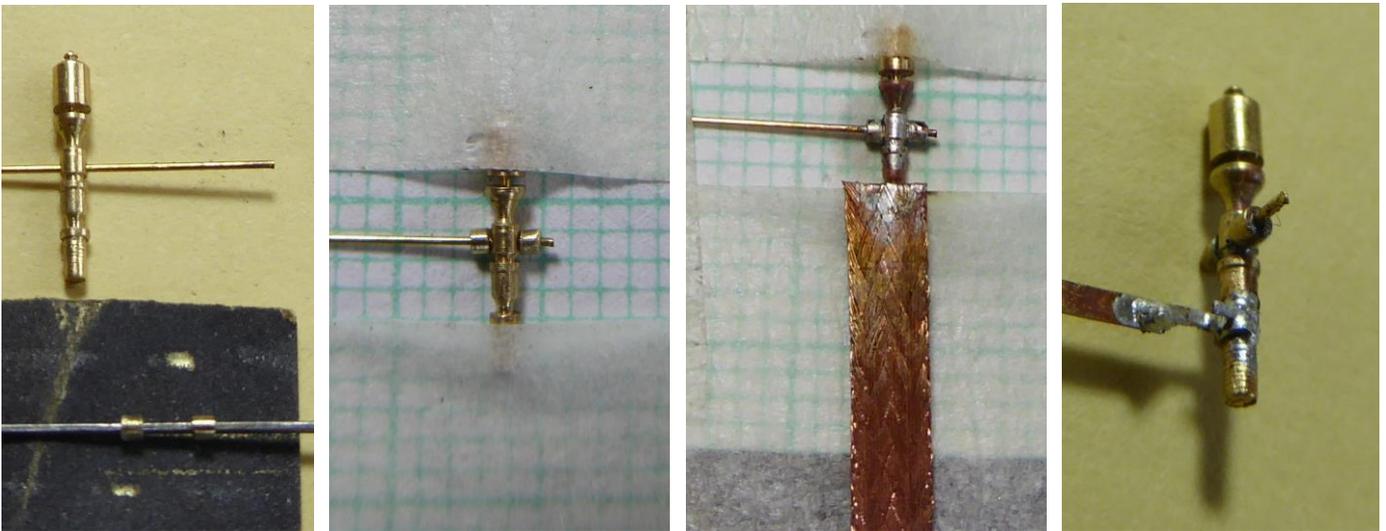
I believe that the chimney fitted here was provided in the JM kit, along with Johnson variants for the earlier engines, for which alternative cab parts and bunker rails were also provided. It already had the characteristic taper which distinguished the Avonside and other SDJR classes. Certainly, I did not have to do a great deal of fettling, apart from the usual casting seams. However the over-thick rim and 'blind' hole required refinement and a degree of drilling out deeper, the result being shown, left. The stem was also reduced in depth and the base flare pared and otherwise fettled to seat neatly on the smokebox.

I now always use a pair of engineer's squares to aid the setting of a chimney vertical, while the Steel Araldite epoxy sets off. Finally, after trimming away excess epoxy at the base and fettling, I had a cleanly - seated taper chimney.

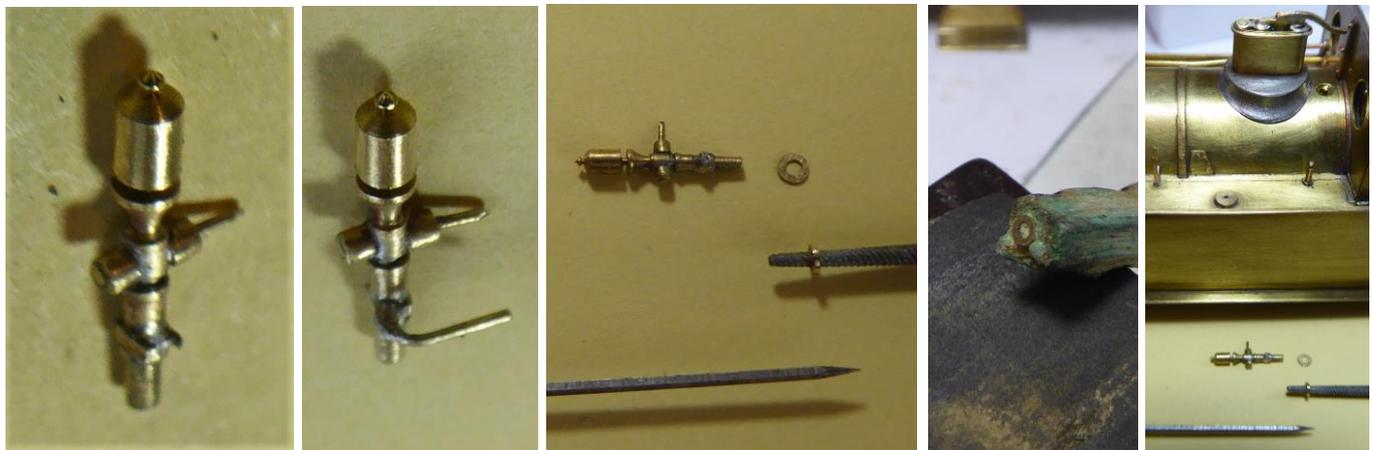
## Whistle



A neat turned MR whistle from Alan Gibson deserved some extra work to add the operating valve rod and steam supply unions, working from photos of No.31. The sequence above shows: the drilling of the stem to receive the valve rod; the parting and drilling-out of some fine brass tube to form 'glands' on the 0.31mm rod; and the offering-up of a second length of 0.31 brass rod to form the steam feed.



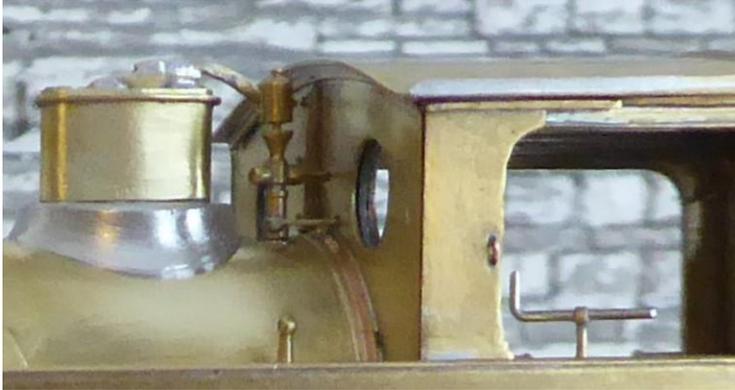
In this sequence: the brass tube 'glands' are fettled and reduced in diameter on emery, while mounted on a broach; the valve components are set up and aligned against graph paper; 296deg solder is applied to the fluxed joint and excess solder is wicked away on copper braid; the valve rod is trimmed back and some narrowed brass boiler band strip is formed round the stem to create the steam feed union.



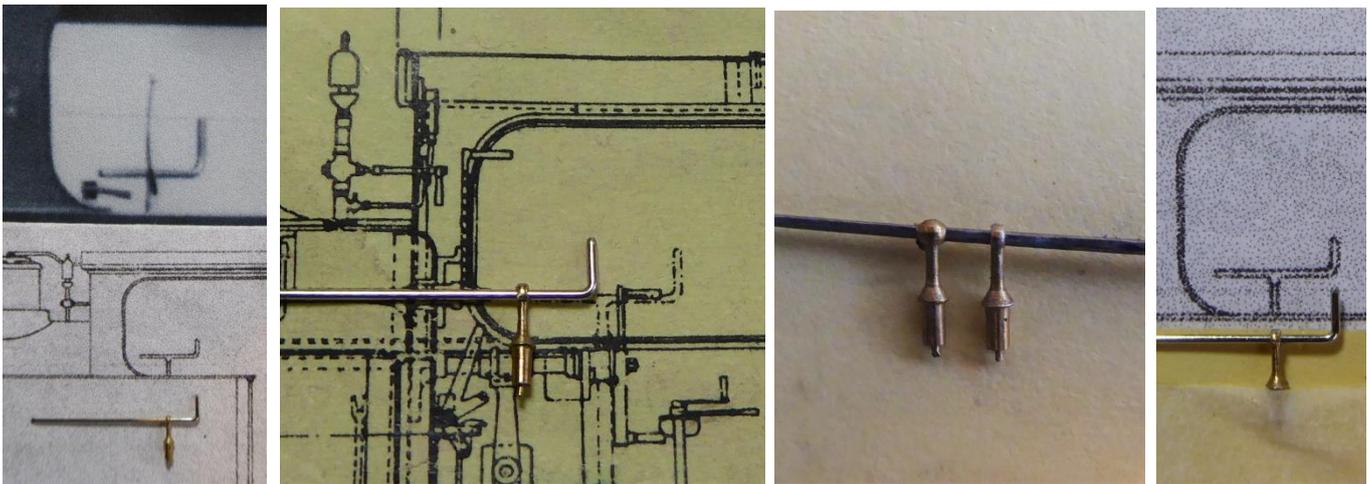
The left hand pair of images shows the steam feed union, followed by the addition of the feed pipe. On a trial fitting to the firebox locating hole - another eyed-in location - I discovered I could not feed the steam

feed and the valve rod through their respective holes in the cab front. So, off came the steam feed, to be added *after* installation of the whistle on the firebox with the operating rod located in the cab front hole.

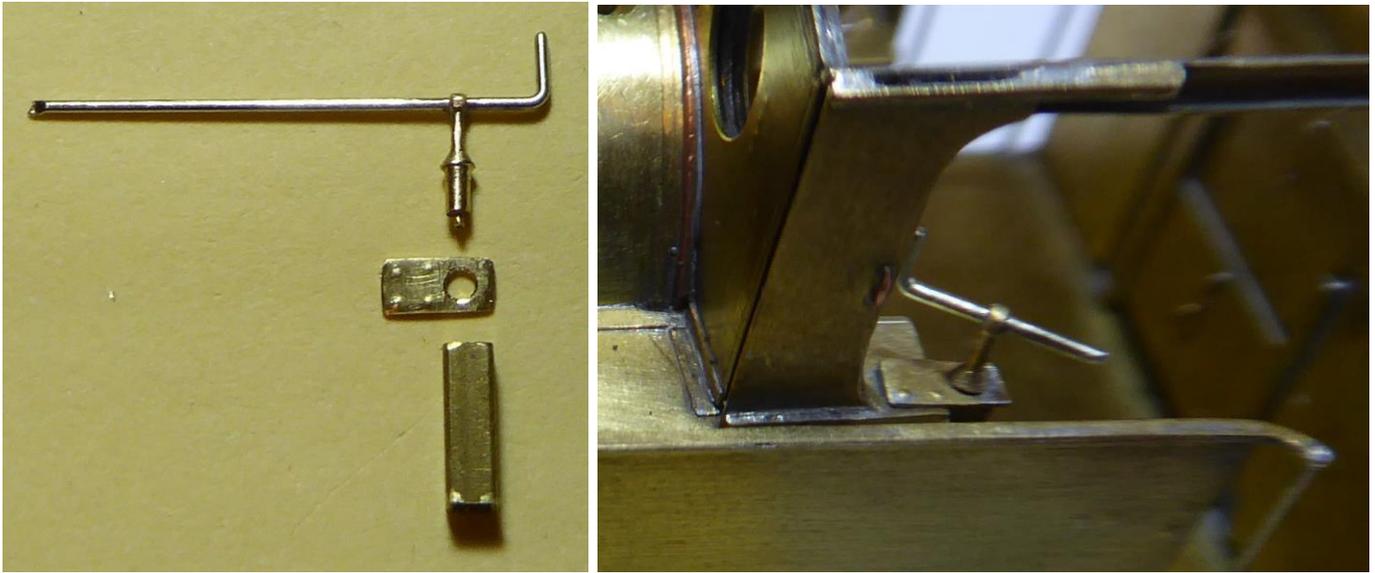
The second pair of images shows the refinement of a washer to form the base flange, using a broach, round file and emery. The third image shows how the washer was embedded in balsa to assist in rubbing down its thickness. Finally, the whistle ready to be fitted into a countersunk hole, which allowed the flange to sit so that it barely projected, creating the required thin-ness. Below, the whistle installed, with steam feed pipe re-instated at the base.



### Handbrake & stanchion

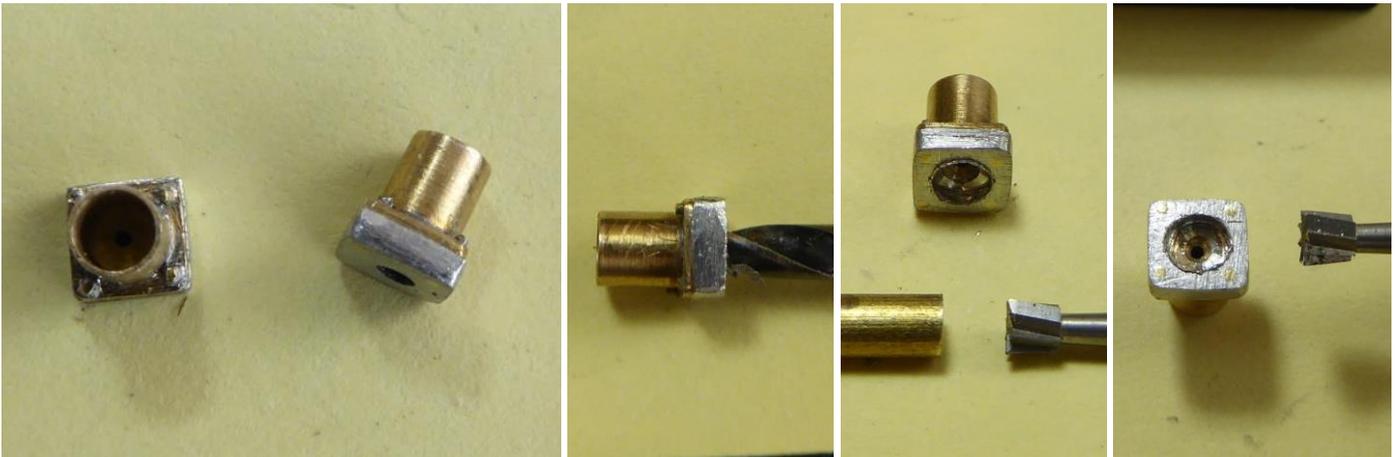


Photos suggested that the handbrake handle stood taller than in Tom Lindsay's drawing, left. John Childs' Vulcan drawing was 7mm scale and gave a slightly more detailed impression. Having selected a suitable long handrail knob as a basis for a firm 'T' joint, its head was filed back and reduced in diameter to give a finer appearance. The handbrake is relatively vulnerable to damage, and for now I am happy to live with the over-prominent joint; it can be refined after final cab detailing and the painting of the engine.



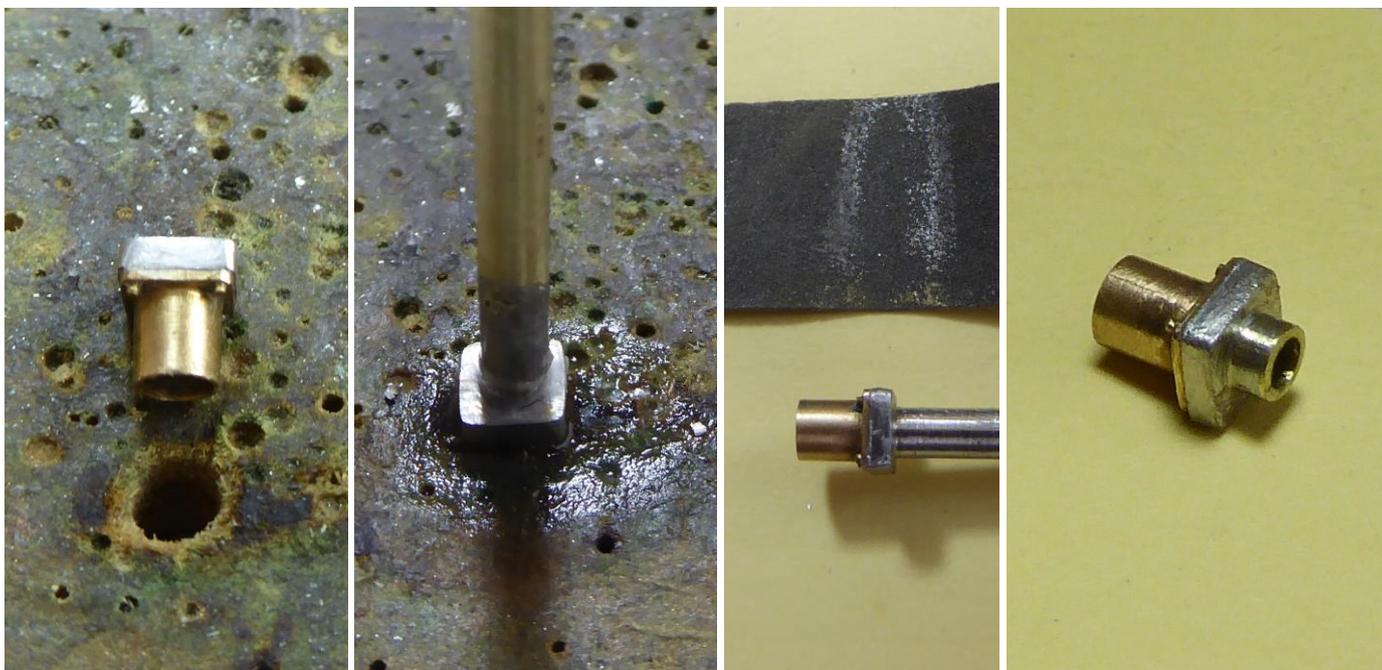
Finally, a representative bracket and square-section 'sleeve' for the brake screw were created, to fit on top of the cab locker behind the side tank. This is based on part photo evidence, part Vulcan drawing evidence, and part MR 0-4-4T photo evidence, in the absence of anything definitive. Despite appearances, right, that bracket does not foul the sliding cab shutter which sits outside the cab-side beading.

### Buffer fitting



I described the detailing of the Gibson turned buffers in my previous Avonside instalments, namely the addition of four wire 'bolts' and a whitemetal spacer pad to each buffer, shown above left. When it came to fitting these to the engine, towards the end of the detailing work on the body, I felt uneasy about using a simple 100deg soldered joint for something that could potentially take a degree of 'knock' in service.

My solution was to fit a short brass tube stem, to fit into the locating holes in the buffer beam. I carefully enlarged the hole in the white metal base with a drill bit, then used a dental burr in a pin chuck to 'square off' the base of the hole.



Before soldering the stem tube into the enlarged hole in the whitemetal buffer base, I created a close-fitting hole in some scrap MDF used for drilling operations, and moistened both this and the inserted buffer item. I had left the stem tube uncut, so that after fluxing the tube and joint I could run molten 100deg solder down into the joint, while keeping the soldering iron a short distance up the tube, to avoid inadvertent melting of the whitemetal pad.

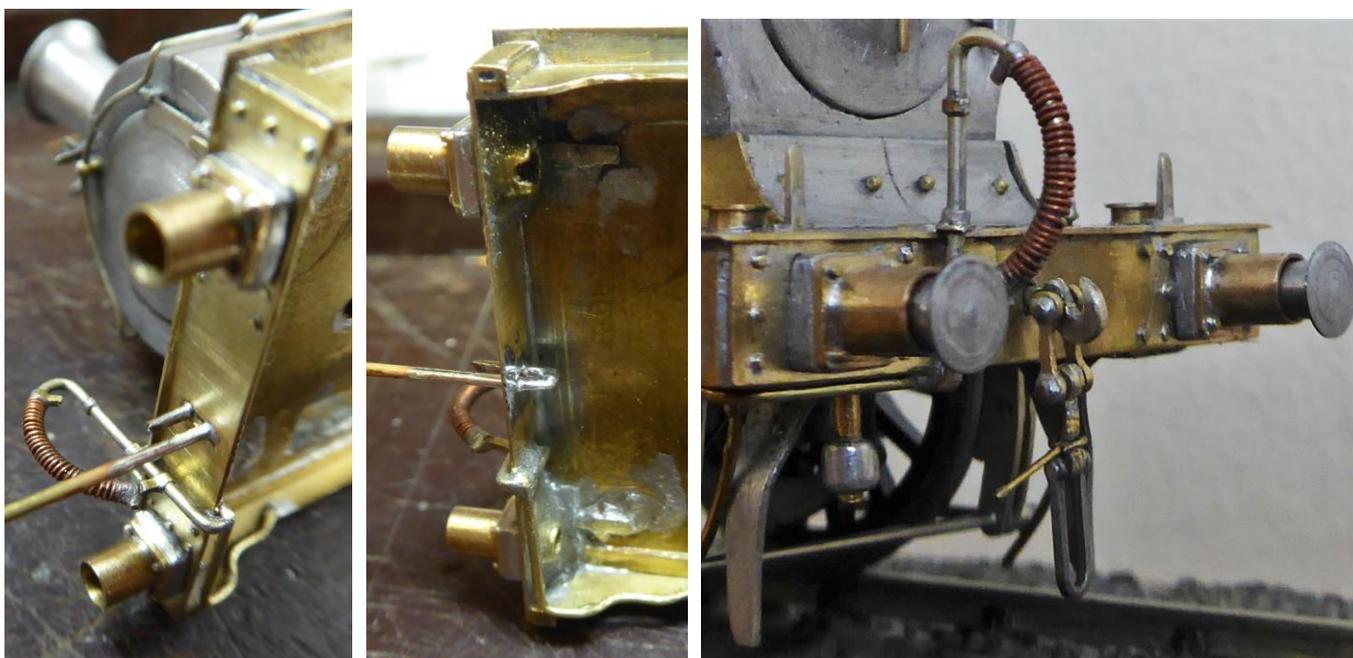
The stem joint was then fettled on emery, before being trimmed off to leave an adequate 'key' for an epoxied joint on and behind the buffer beam, above right. The use of Steel Araldite epoxy, rather than soldering, allowed me to make final adjustments to the 'sit' of each buffer as the epoxy set off, and also avoided the dangers of damage during a soldering operation.

## Couplings



The kit provided neat laminated nickel silver coupling hooks, which were assembled and the hooks fettled to a tapered point; the rear coupling shank had to be shortened to avoid fouling the rear guard iron support bracket. I had space to fit a spring behind the front coupling, retained by a miniature split pin through the shank; the rear coupling makes do with a slightly slack split pin retainer. The lower links and screw section used old Exactoscale functional items, with the squared material of the links well-filed to a more rounded profile. The upper shackle links utilised the central screw section of Mike Clark's 'Masokits' brass coupling etches. The loose 'tommy bar' is 0.31mm brass, closely formed around the screw section of the unit.

The other two images, above, show the over-deep etched coupling hole in the buffer beam (fore and aft), and my solution based on a loop of squared brass wire (0.6 or 0.7mm, from memory), to take up the slack.



The squared brass loop has now been soldered in place with 188deg solder. After trimming the excess and filing back flush, front and rear, the couplings could now sit comfortably in the reduced slots. This 'cruel enlargement' shows the completed front end detail of No.31, very satisfying to see at last – although that vacuum hose really does cry out for the wire 'hose' detail to be sorted out, to remove the unsightly gaps.

## Rear guard irons

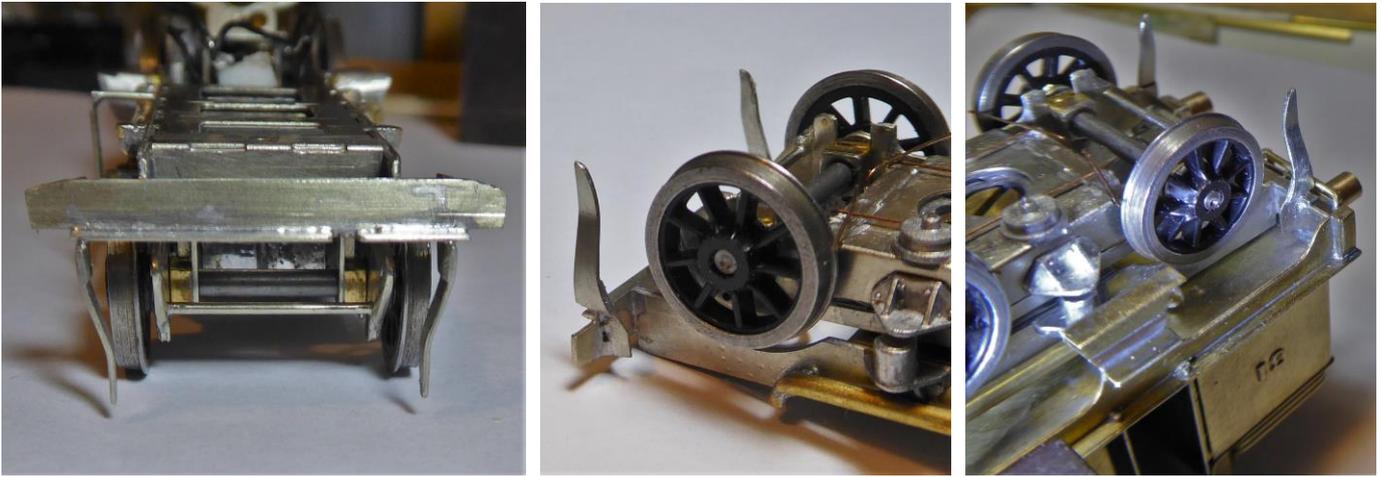
Nearly finished now - but these two simple items caused something of a problem, initially - there was nowhere to attach them! In MR 0-4-4T examples, and many others I have come across, the rear guard irons were attached as normal to the rear of the frames, and then *angled outwards* to track gauge, towards the base. It seems the obvious thing to do?

However, the Avonsides, for some reason, had the rear guard irons attached to the *buffer beam*, directly behind the buffers, and thus needed to be *angled inwards* to track gauge. I wonder why?



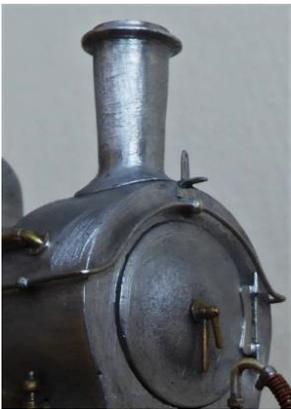
The kit provided notched nickel silver (good - strong!) guard irons, left. However, as with the buffers, I was not happy about a simply soldered connection, especially since the kit provided no means of representing the thickness of the timber buffer beams - the notched items would be 'hanging in mid-air'. I also felt that the guard irons ought to belong on the model's chassis, not the body.

After some head-scratching, my eventual solution incorporated a) a horizontal projection beyond the Rumney chassis's frame ends, which represented the bottom of the timber buffer beam, and b) a vertical beam representing the rear face of the buffer beam. These items were fabricated from nickel silver etch waste. The centre image shows the underside of this 'buffer beam' projecting from the rear of the chassis, with the 'rear of the buffer beam' structure visible below it. On the right, the rear of this 'buffer beam' is prominent, as is the notch in the base of it, to accommodate the vacuum brake fitting on the body.



In this sequence, the guard irons have at last been installed, soldered behind and under the new 'beam'. The unusual inward-angling to track gauge is evident, and would perhaps be a distinctive feature of an SDJR Avonside 0-4-4T approaching 'bunker first'.

### Smokebox door lamp iron



Finally, to finish this detailing saga, we return to the front of No.31, and the smokebox lamp iron, whose fabrication was described in the October 2020 instalments. With the chimney securely in place above, it is now safe to fit the lamp iron with Steel Araldite epoxy and fettle the excess. That's it; thanks for reading!

### SDJR Avonside 0-4-4T No.31, Some Final Overviews.





Thank you for following this project, I do hope there are some useful tips and techniques in there somewhere, for your own projects? Meanwhile, enjoy the rest of Virtual Missenden Spring 2021 and *'watch this space'.....*

*Steve Duckworth, February 2021*