

same way the other end should be soldered to the etched hook. Finally a hook, formed from a bent pin should be fixed in the outer end panel for the chain to hang from when not in use. Check on photos, for the exact position. Sorry this feature has been added since the etching work was completed.

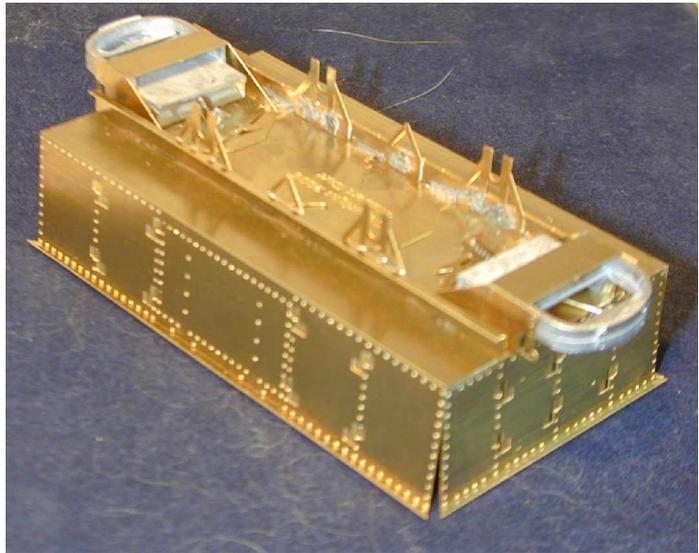
**I am indebted to David Churchill of the Darjeeling and Himalayan Railway Society for the drawings and photograph of the prototype wagon.**

## MODEL RAILWAY DEVELOPMENTS

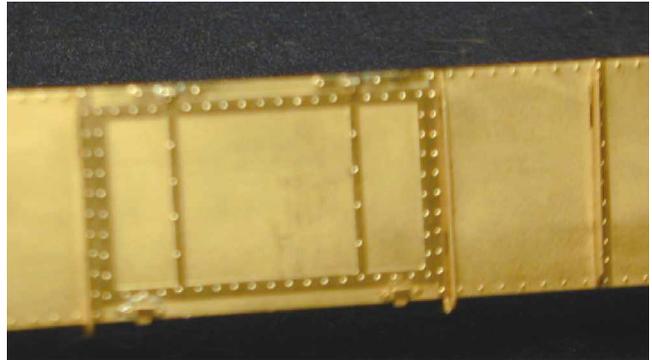
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rivets on the side will act as clips, and good snug fit should be achieved. Carefully take part 6 out, and spread 5 minute epoxy over the floor and reassemble. Placing the assembly upside down on a smooth bench, use some packing pieces on either side and a few heavy books to ensure that the top flanges are at matching levels.

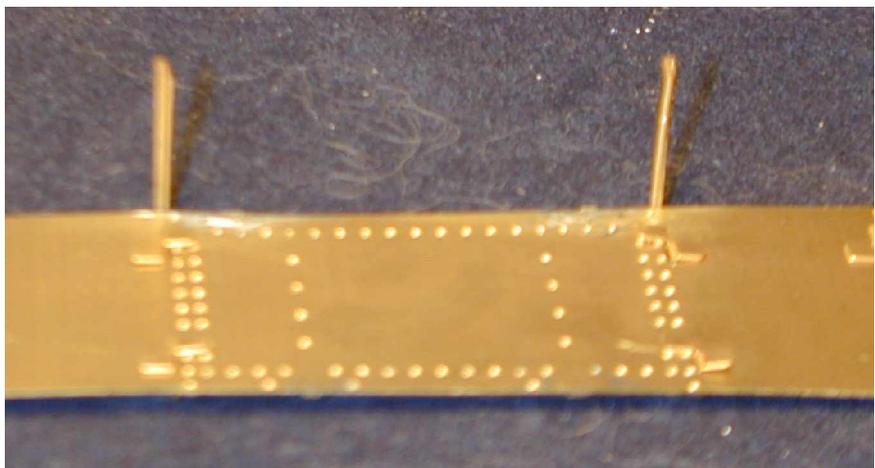


9. While that is curing, turn your attention to the sides, **Parts 7 & 8**. The door hinges are formed at the tops of the doors, by fitting a staple bent up from the wire and inserted through the holes, then folding over the thin, rivet embossed projecting strip. Use either superglue or a tiny smidgen of solder – if you really are confident, definitely a case for solder paint if you have it. Solder the wire on the back using a minimum of solder. Then cut away the projecting wire and file down to the back of the sheet. Fit the cosmetic door catches (**Part 9**), 2 to each door by inserting the tags through the side and a touch of solder, on the back. There are quite a lot of these on the fret, but you will only need 4 in total – on the other hand a lot of these, being so small fell out of the fret.

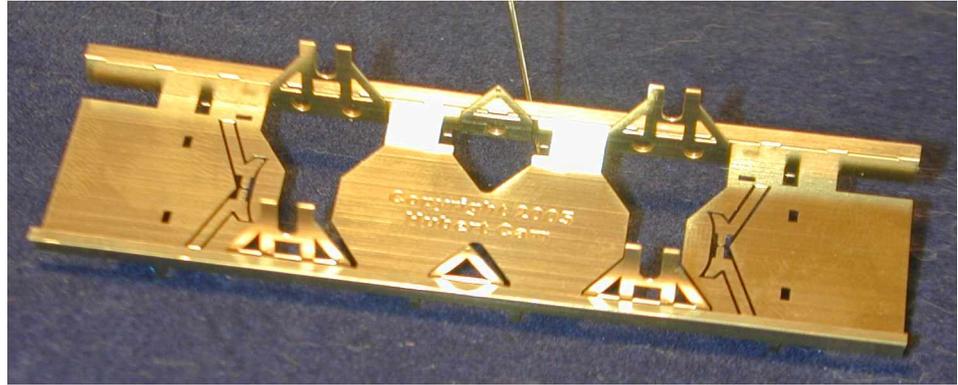


10. Before you fit the vertical ribs, it is best to fold the ends over. Start by holding the side part of the drop down length at the ends, so that the groove is over the edge of your mdf. A steel rule is handy for this, and a needle file will catch the outer edge of the flap, so that it will bend down to form an angle section. The main end can then be bent down, but using the end of the mdf, you will find that a thumb pressed over the fold will be rather better than a mechanical grip such as a straightedge. The problem here is to fold at the etched line and not at the edge of the panel.

11. The vertical ribs are now fitted. Those on either side of the door **Parts 10**, are handed. There is a triangular plate which is to be folded back at 180°, and there should be a flat on the other side which forms a

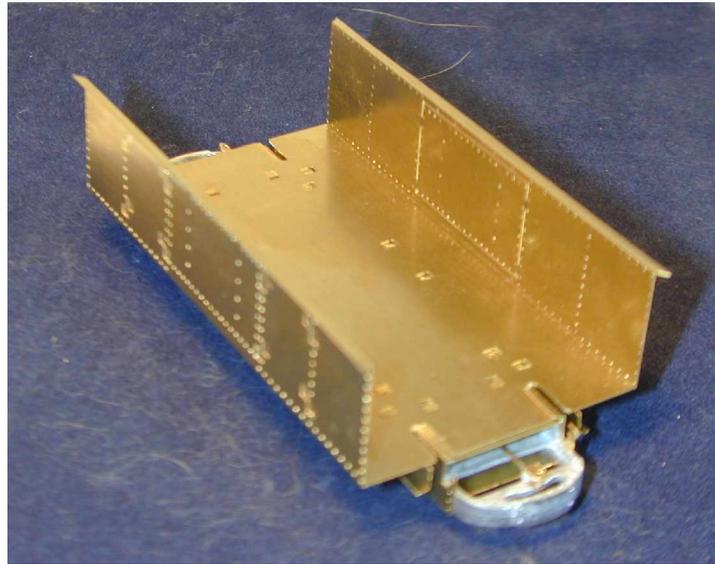


Holding each guide in turn with a file/scriber etc. touch the iron on each until you can see the solder puddle within the



hole. If necessary, fine tune the angles of the bends to ensure that all is square, and then run a little (a very little) solder into the inside of the bends – or use epoxy resin.

6. The next operation is to press out the rivets from the back face of each of the inner sides (**part 5**). The sides of one side door have not been etched. You should scribe these in, or cut a fine groove with a skawker. On the other side the recess on the face has caused a slot to appear on the inside of the door. I'm not sure which side is best, but as you can only see one at a time, it shouldn't matter. Fold out the top edge at right angles, making sure that the rivets face up when you fold the top edge down. Then fold the sides up, and check that the tabs are filed smooth along the edges.



7. Whilst the test etches used a fabricated buffer unit, the castings and their securing bracket require slightly closer slots in the ends of parts 4 and 5. The easiest way to open these slots out is with an abrasive disc cutter in a minidrill, however snips, or a good pair of scissors will do the job if you are careful. About ½mm needs to be shaved off each side. After this little bit of adjustment the chassis is then offered up to the lower floor and the 8 tabs are bent over to secure them. The buffers are offered up to the floor and chassis assembly, and the tabs also bent over – be careful to slot the inner tabs in before they get bent. The brass is quite hard which means that tabs will break off very readily if bent backwards and forwards. Finally and somewhat cautiously, a small dab of solder is desirable on the tabs. Although there are recesses in the upper floor for the tabs, it is worth putting a spot of solder onto the tabs. There is now quite a lot of brass to heat up before the solder will take, and you may have difficulty in limiting the amount of solder, unless you use solder paint. If you get large blobs, these will have to be filed down. The mini disk is again a useful tool, but a sharp file will do the job too.
8. Press out the rivets on the inner floor and the ends, (**Part 6**). Check by frequent inspection of the other side that you have not missed any. As with the sides bend the top flange over and then bend the ends up. Check for fit, you will find that the lower

2. A further pin is passed vertically between the knuckles and is soldered to one knuckle. In order that the whole lot does not solder up solidly, slip a piece of paper between the parts of the joint and then push the pin through this. Whilst the 2 parts may be alternated, it is better to squeeze one end with pliers, or in the vice so that it fits between the other part. After soldering (a quick touch with a solder laden iron onto the pre-fluxed pin) cut the pin off and file down to a smooth neat joint.



3. Drill the buffer casting with a hole of about 0.8 - 1mm dia, in the centre of the inner upright panel, and fit the coupling. You could add a short spring (a short length of old ballpoint pen spring) and with a washer, or offcut of brass secure it behind the buffer casting. As before do not rely on solder alone, but bend the pin so as to form a mechanical anchorage.

4. **Part 3** has 3 rivets on each side which need to be pressed through the indentations with a scribe, (needle in a pin vice, or old school compasses). The buffer casting is wrapped with part 3, using a smear of rapid epoxy glue between them, and a clothes pegs to hold them while it sets. Repeat this for each end of the vehicle.



5. The chassis (**part 4**) is folded up, or down as shown. At this stage it is better not to fold the brakes down as they are too vulnerable,



but it is worth just pushing them down a bit to make them easier to fold later. Note which way the folds go. With the writing facing up, fold the edge down on each side. This is best done along the edge of a piece of cleanly cut mdf (medium density fibreboard), using a scalpel handle or steel ruler. After doing both edges, turn the etch over and bend the solebars down on each side, leaving the axle guides and brake 'vee' sticking up. Finally bend each of the axle guides and the brake 'vee' down on the inside of the frame. With the solebar held down along the edge of your bench, flux each of the five holes against the solebar, and drop a wee bit of solder into each.

## Instructions for the Assembly of the DHR Open steel Wagon



**Contents:** 2 No. etched brass sheets of 10 thou brass.  
2 No. axles of 10mm dia disc wheels to 16.5 mm gauge  
4 No. brass bearings  
4 No axlebox castings  
2 No. buffer block castings  
7 No. brass lacemaker's pins  
50mm 0.6 dia brass wire  
Safety Chains and Hooks

**The kit provides a coupling based on that used by the DHR. It consists of a slotted link between the wagons. This is then held by a removable pin to a short bar which will swivel on the fixed end. This is sprung from a cross-member beneath the wagon. The buffing block is made from a piece of steel channel curved around and fixed between the solebars on each side. This has a rubbing plated riveted to the face and a curved slotted plate above to reinforce the channel. On the model, this assembly is represented by a casting and fabricated links. If you wish to fit automatic couplers such as Kadee, then these should be fitted to the castings, at the appropriate height, and you should skip to paragraph 3 below.**

1. The first job is to make up the coupling and to fit it to the buffer casting. **Part 1** is folded up, without cutting the side strips off, and a brass pin is threaded through the centre holes. The pin should be bent at right angles before it is cut off at the second knuckle. It is suggested that the pin is bent after making the first fold, but that the second fold should then be made at each end before soldering. It is then locked with solder at both ends after which the side strips may be removed. Remember the whole train will be pulled through this link. The inner knuckle (**part 2**) is made up with another pin through the centre hole.

