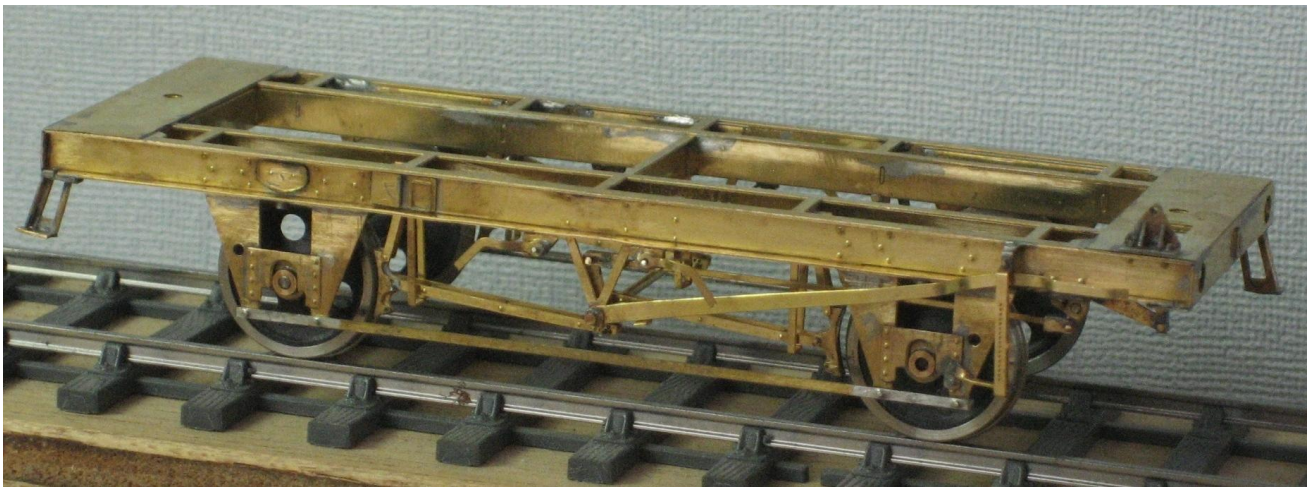
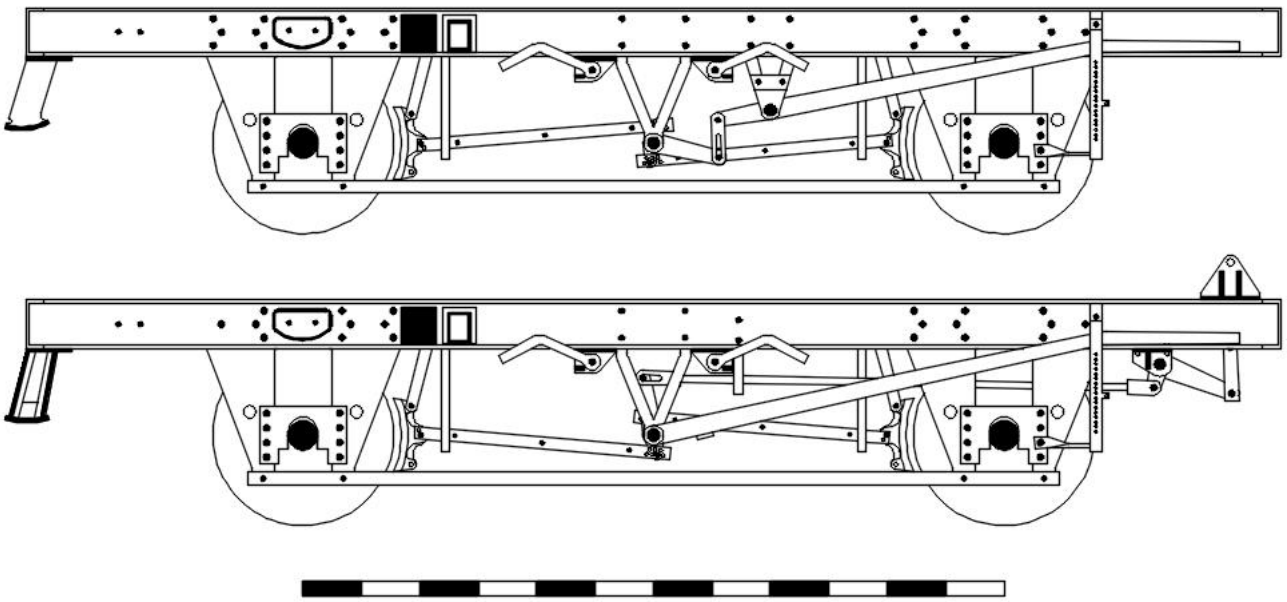
Rumney Models – 21T Hopper Wagon Chassis Instructions

Notes

These instructions cover the Rumney Models chassis kit B.28. Note that this chassis is suitable for EM/P4 only and will require a small degree of modification if building in EM.

This kit is designed for those 21T hoppers with welded bodies which were fitted with BR plate axleguards and RCH lifting link brakegear. Specifically these are BR diagrams 1/146 and 1/149. The kit will provide a complete sprung chassis with a prototypically open underframe. Vacuum braking apparatus is provided for should you wish to model a fitted example. The chassis is intended for the Parkside Dundas kits PC77 and PC78.





The steel bodied 21T coal hopper wagon had its origins in the North East of England as an updated version of the NER wooden hopper. LNER built versions had the NER clasp brake with a distinctive tall lever guard which went up above the chassis. After Nationalisation BR continued to build examples, initially with the NER brake, but then with the standard RCH lifting link brakegear. Some later wagons were vacuum braked and a small number were through vacuum piped.

Publicised details of the various lots are pretty long winded and aren't necessarily clear. Rather than copy it all out and find myself scratching my head where the details don't match I will simply refer the reader to the two following books:

Wagons of the Middle British Railways Era by David Larkin
British Railways Wagons, the first half million by Don Rowland

Construction Notes

Read through the instructions first and familiarise yourself with the components. Drawings and photographs taken during the construction of the test etches are included to attempt to make my waffle clearer. Note that not all the photos are from chassis covered by this set of instructions but they will suitably illustrate the point in question.

All fold lines are through 90° with the fold line on the inside unless stated otherwise.

Everyone has their own soldering methods. I now use a temperature controlled soldering iron with predominantly 145° solder and La-Co paste flux. For a long time I used an Antex 18W soldering iron on virtually everything with few problems.

Check all holes before removing parts from the fret. The drawing process for etching if you use a CAD program as I do is extremely accurate but the actual etching process itself not an exact science. If the fret is slightly over etched then there is no problem but if they are under etched the holes will need enlarging. I find that this is easiest to do before removing parts from the fret. The hole sizes will be noted at the appropriate points.

Technical

The suspension is individual springs made from 0.008" steel guitar wire soldered to the etched spring/bearing carriers. For this you will need a suitable flux. I use Carr's Black label. If the finished vehicle is weighted to 50g with the weight evenly distributed then this will produce a spring deflection of 0.5mm. Don't be tempted to up the gauge of spring wire. Even moving up to 0.009" springs will have a significant effect on the spring deflection. Also don't over weight the wagon or the springs will not have enough upwards movement before they hit the W-Irons. Think of the 50g total as an ideal weight but also a maximum. There are notes on weighting the wagon at the end of the instructions.

The chassis is designed to produce a buffer centre height, when the kit is completed and weighted to 50g of 13.8mm when using Exactoscale wheels. The Exactoscale wheels are 13.4mm (3'1½") in diameter. Different makes of wheel may affect the ride height depending on their diameter.

Materials list

A few different sizes of wire are needed to build the chassis. Eileen's Emporium are good source for these and they do a mixed sizes pack if you don't want to buy large quantities.

0.31mm - Brakegear, tiebars, lever guards, hopper door mechanism
0.4mm - Brakegear
0.7mm - Vacuum brake cross shaft
0.8mm - Main brake cross shaft and lifting link brake levers
1.0mm - Alignment pins

You will also require items such as wheels, bearings, buffers, axleboxes and springs as well as couplings to complete.

For buffers I would recommend those produced by Lanarkshire Model Supplies. They are by far the best around and a lot of types of buffers are available pre drilled for fitting sprung buffer heads. This service is particularly useful for heavy duty buffers with their large 2.5mm shanks. The quality is excellent. The majority of wagons that are covered by these chassis will have had 1'6" buffers. Lanarkshire Model Supplies do various suitable 2 rib and 4 rib examples. Some lots had GWR type 1'6" heavy duty buffers, some vehicles were retrofitted with 1'8½" Oleos. As always check your prototype. If you intend to make your buffers sprung then both MJT and Wizard models do turned heads and springs.

Axleboxes and spring castings of various types are available from MJT and Wizard models. The MJT 7 leaf springs are pretty good and Wizard Models do a good heavy duty BR two part oil axleboxes along with various roller bearings. Most of the later lots were fitted with roller bearings from new and many others were retrofitted with them in the late fifties/sixties.

Lanarkshire Models also do cast swan neck vacuum pipes, code VP03 for fitted or through piped wagons. These look very good but being whitemetal I find them quite fragile. Homemade ones from brass rod and very thin wire would probably be a better option.

You will need a 21" vacuum cylinder for a fitted wagon. Wizard Models do a hopper vacuum cylinder with the right sort of brackets. Something will also be coming in the not too distant future from Rumney Models.

For couplings I use Masokits coupling hooks and Exactoscale links either 3 link or instanter. The Exactoscale instanter links are particularly good. These are available through C&L.

Contact details for the above suppliers can be found at the end of these instructions.

A note on parts for the vacuum braked option

There are a couple of errors and omissions on the main etch that effect only those wishing to build a vacuum braked wagon. Specifically the brackets for the vacuum cylinder are too big meaning that there is insufficient room for a 21" vacuum cylinder and niceties like swan neck vacuum pipe brackets and lamp irons aren't on there (no idea why they aren't included!). I have therefore done a spares etch to correct these errors (see page 6). If the etch isn't included with your kit and you want the spares etch then contact me for a replacement. The main etch is fine as it is for the unfitted variety.

Component List

1 - Chassis top plate
2 - Axleguard/Solebar assembly
3 - Riveted axlebox guide overlay

4a - Unfitted wagon solebars overlays
4b – Vacuum braked wagon solebars overlays
5 - Solebar detailing

6 - Longitudinal bracing
7 - Short cross bracing
8 - Long end cross bracing
9 - Long centre cross bracing

10 - Brake shoes/push rods
11 - Push rod cranks
12 - Push rod safety loops

13 - Inner vacuum shaft bracket
14 - Outer vacuum shaft bracket
15 - Vacuum cylinder crank
16 - Vacuum cylinder crank overlay
17 - Vacuum shaft link
18 - Vacuum shaft link overlay
19 - Vacuum shaft link safety loop

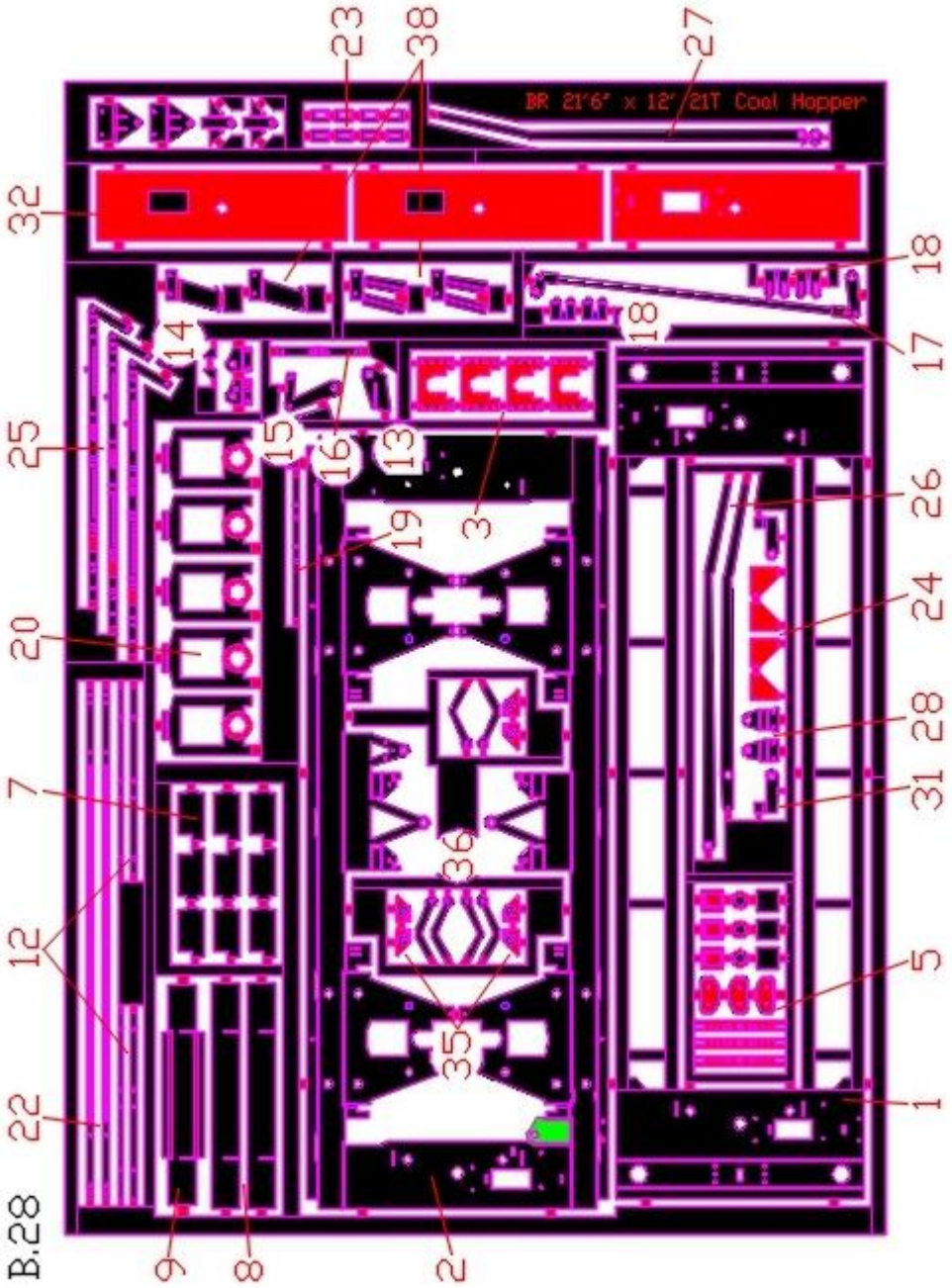
20 - Spring Carriers
21 - Bearing washers
22 - Tiebars

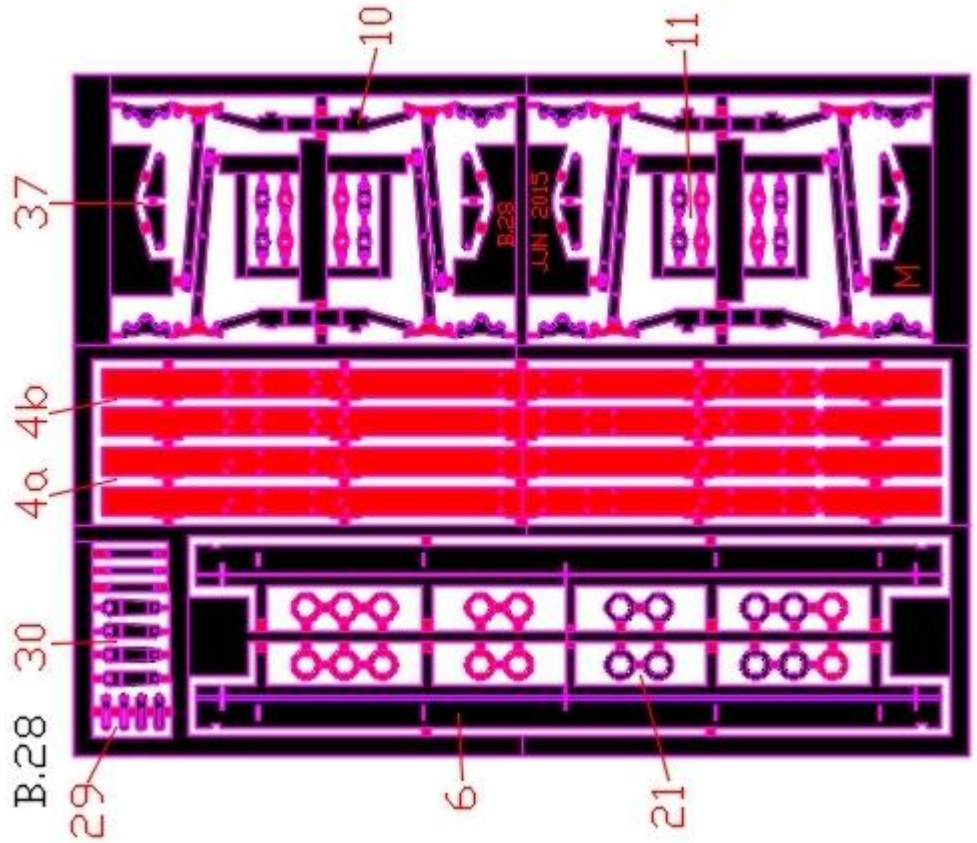
23 - Coupling pocket detail
24 - Solebar/Headstock corner plates

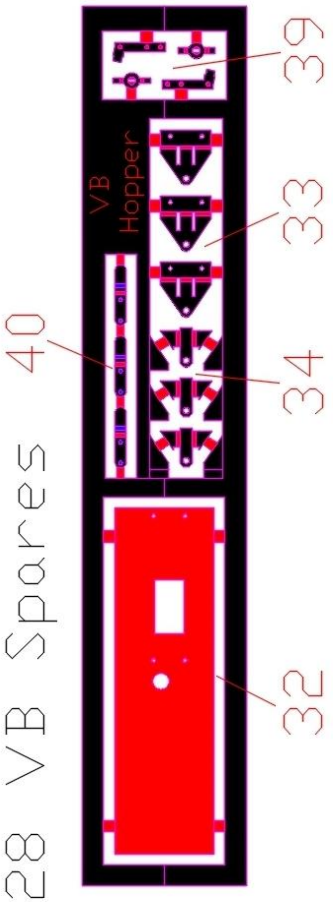
25 - Brake lever guard/bracket/stay
26 - Brake levers
27 - Additional non-lifting link side brake lever with clutch
28 - Secondary brake lever vee overlay
29 - Lifting links
30 - Lifting link cranks
31 - Brake lever actuator

32 - Chassis end overlays
33 - Vacuum cylinder bracket (outside) - See VB spares etch
34 - Vacuum cylinder bracket (inside) - See VB spares etch
35 - Hopper door handle bracket overlay
36 - Hopper door handles
37 - Handrail brackets

38 - Chassis steps
39 - BR swan neck vacuum pipe brackets - See VB spares etch
40 - Lamp irons - See VB spares etch







B.28 VB Spares

BR 21T Hopper - Unfitted

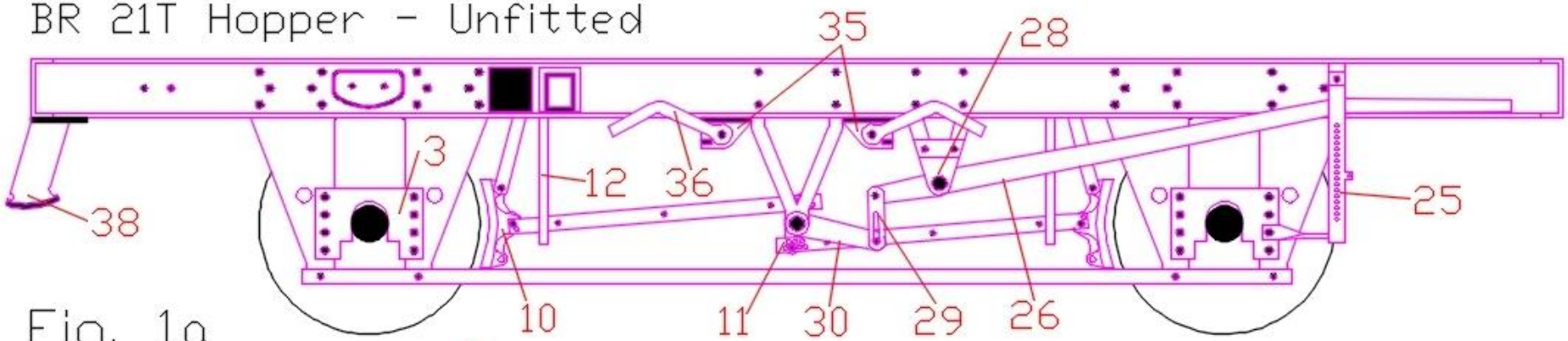
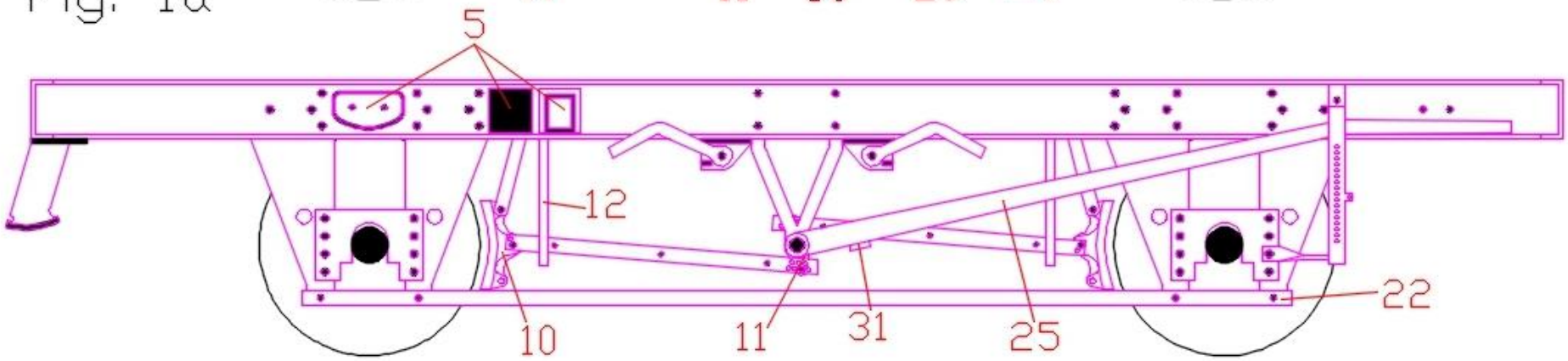


Fig. 1a



BR 21T Hopper - Vacuum Braked

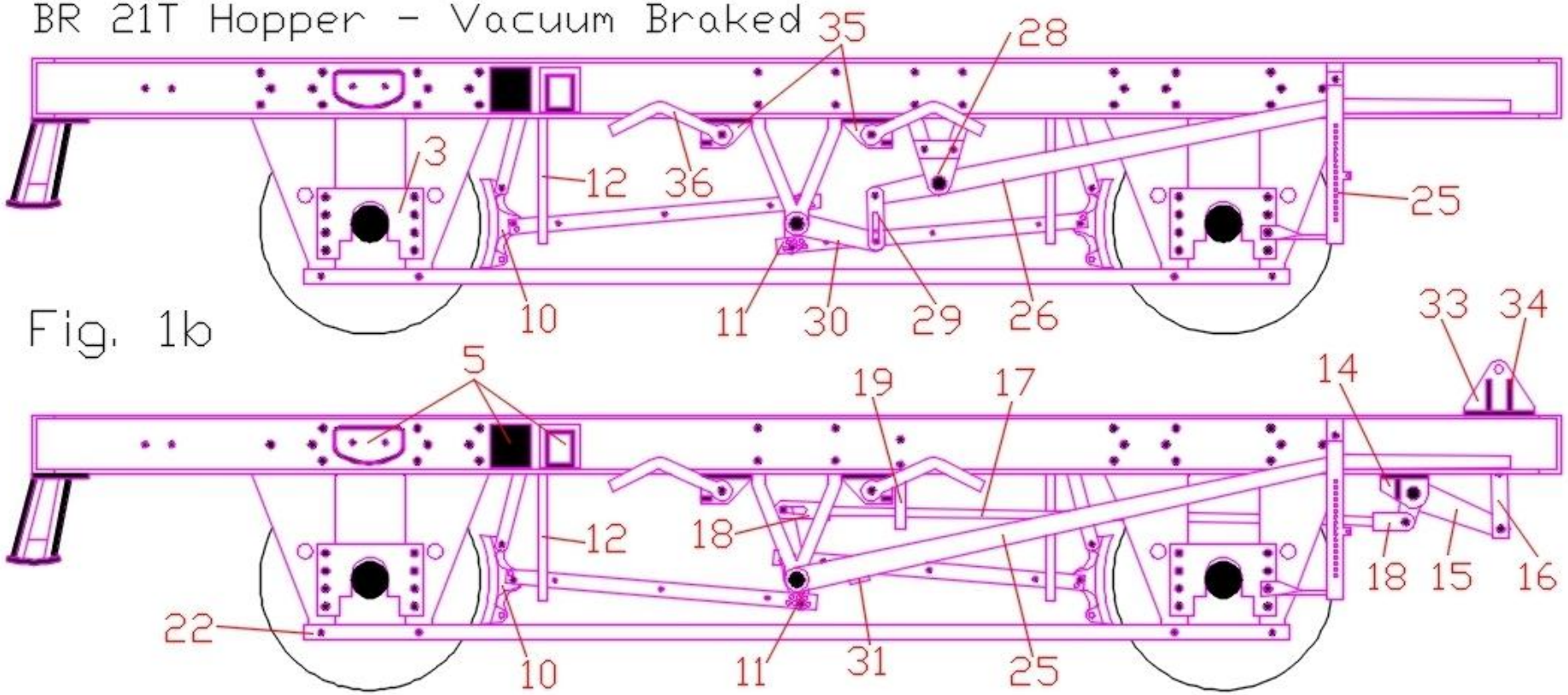


Fig. 1b

Construction

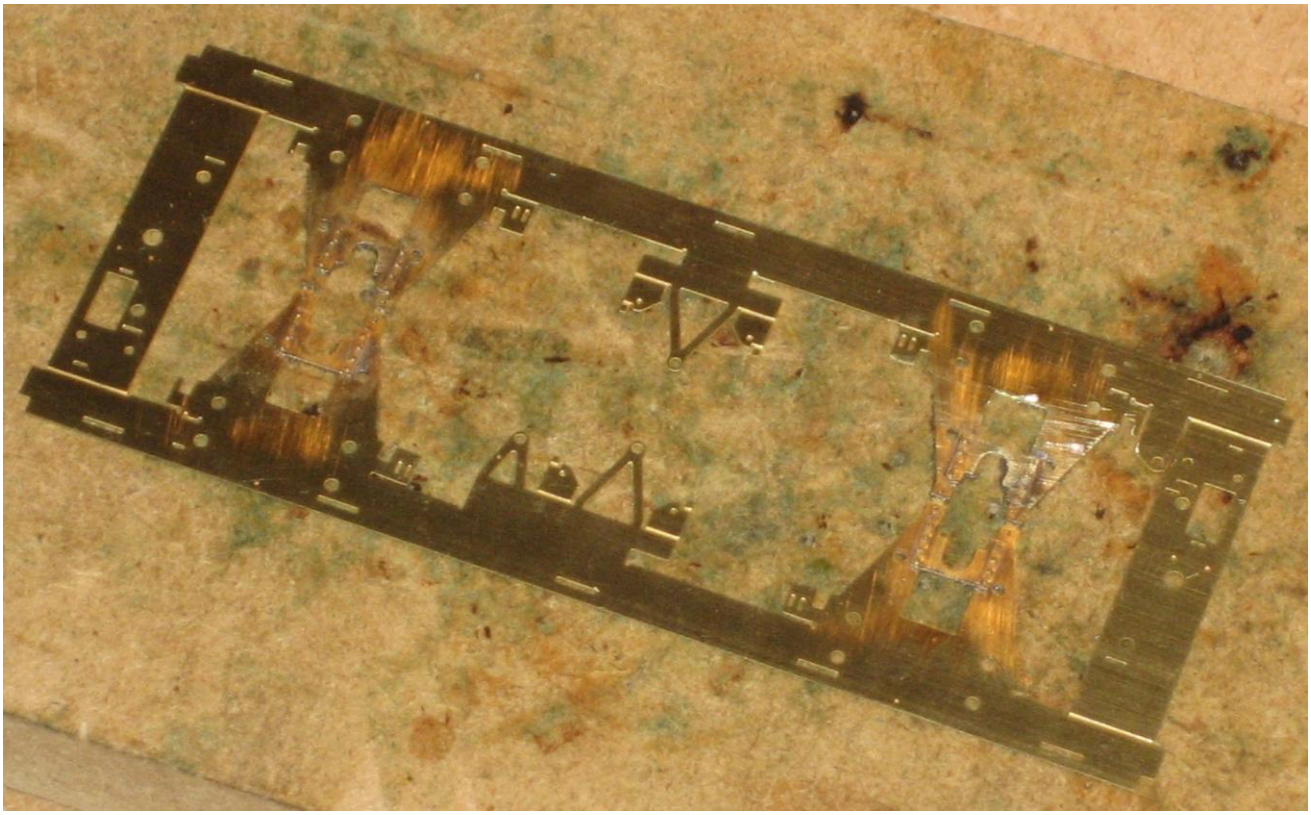
Main Chassis

Start with the chassis top plate (1). Firstly check the fit of your buffers in their holes in the headstocks. It may sound a bit odd starting with something that usually goes on at the end but it will be much easier to open out the holes now rather than later. Push out the half etched rivets on the headstocks if required. Check your prototype. Most welded chassis didn't have them. I find the easiest way to do this is with a drop head rivet press with the fret placed over one of those ubiquitous green cutting mats. Remove from the fret.

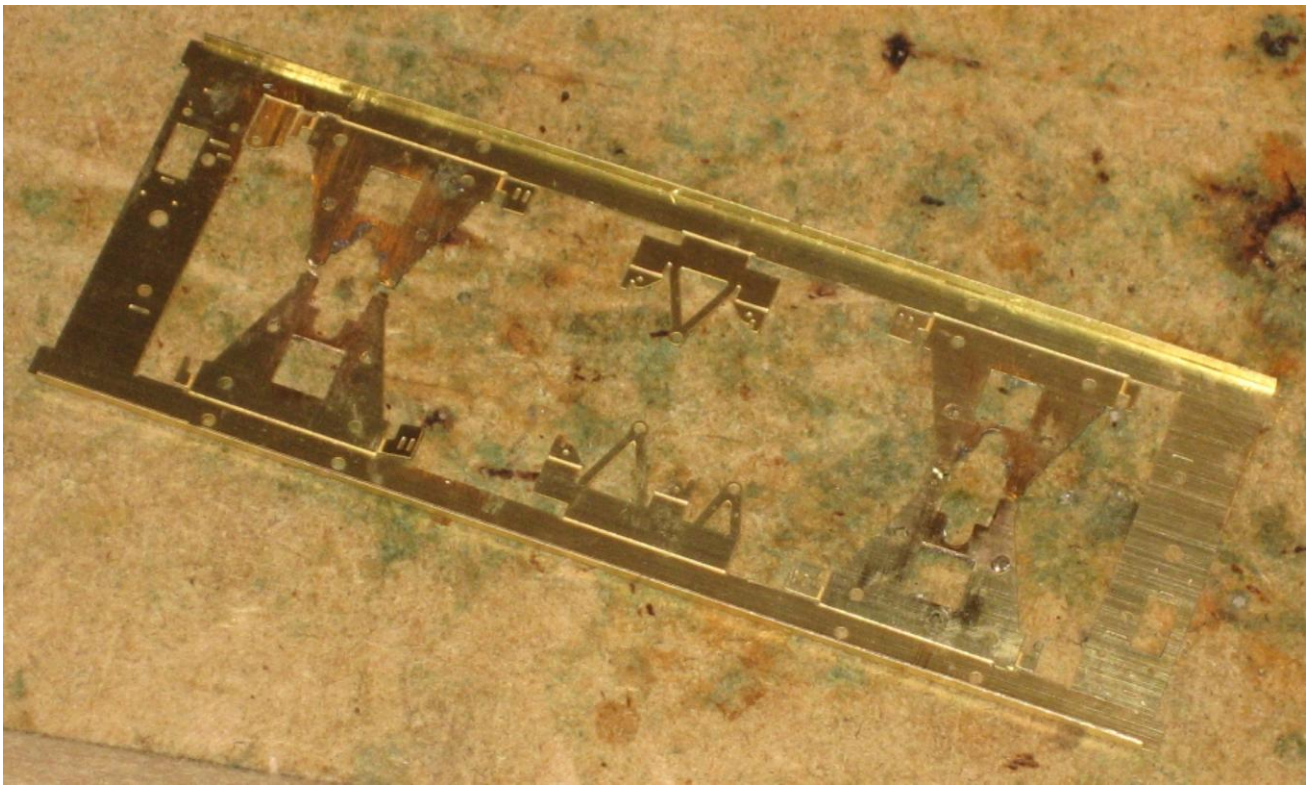
The headstocks need to be folded up. This is best done with the chassis top plate clamped to something or held in a vice to avoid distortion. There are two sets of fold lines as the headstocks need to be folded into a channel. Starting with the outermost end part of the chassis top plate fold through 90°. You can reinforce this fold line of you wish but I haven't found need to do this. Next fold the headstocks through 90° to form a channel. Do not reinforce with solder yet.

Check that all the holes in the in the vees on the axleguard/solebar assembly (2) will accept 0.8mm wire. Check that the small holes in the secondary brake lever vee will accept 0.31mm wire along with the holes in the hopper door handle brackets. If necessary drill out the holes on the backs of the axleguards as per your prototype (they did vary) using a 0.85mm drill then remove from the fret. Remove the detailing from the middle of the axleguard/solebar assembly and clean up connecting tags.

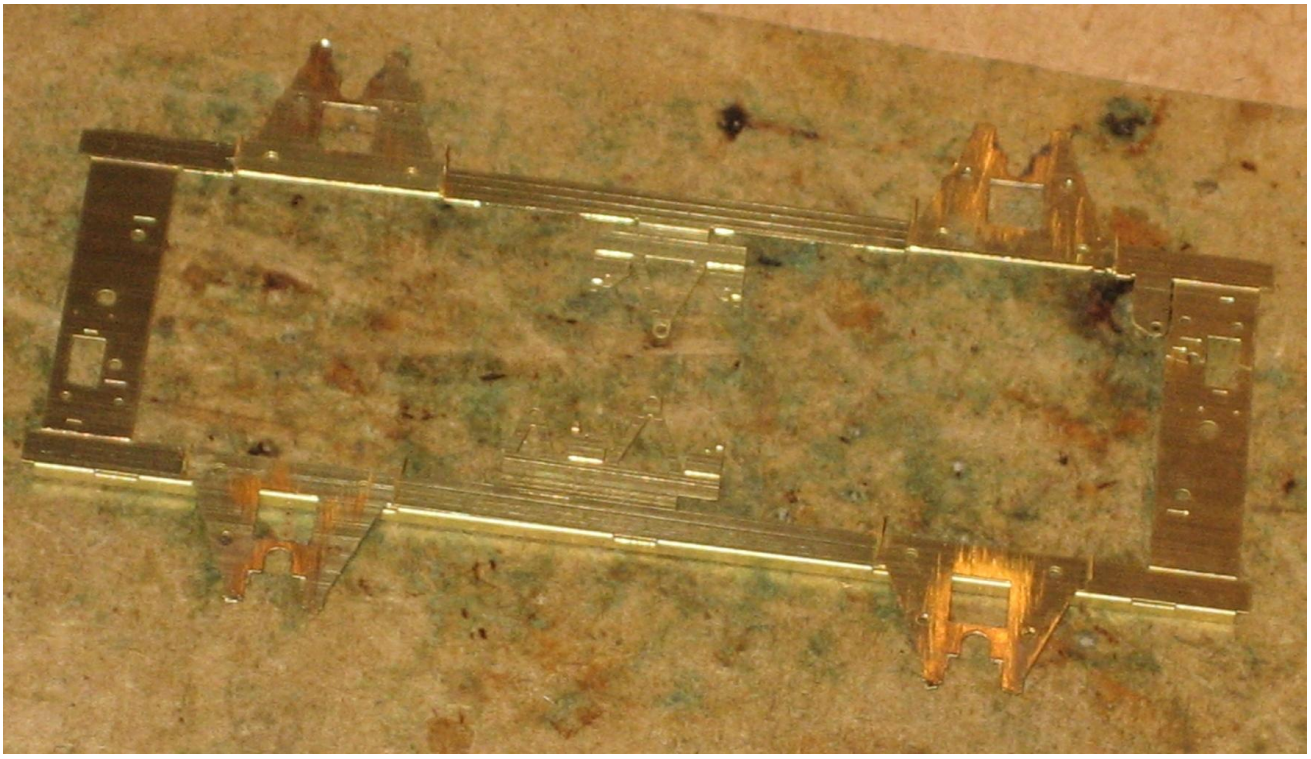
Etched riveted axlebox guide overlays (3) are included on the fret. If you wish to make use of them now is by far the best time to fit them. Use the slots for the axles as a guide and solder in place. Make sure they will end up on the outside of the axleguard. See the photo below.



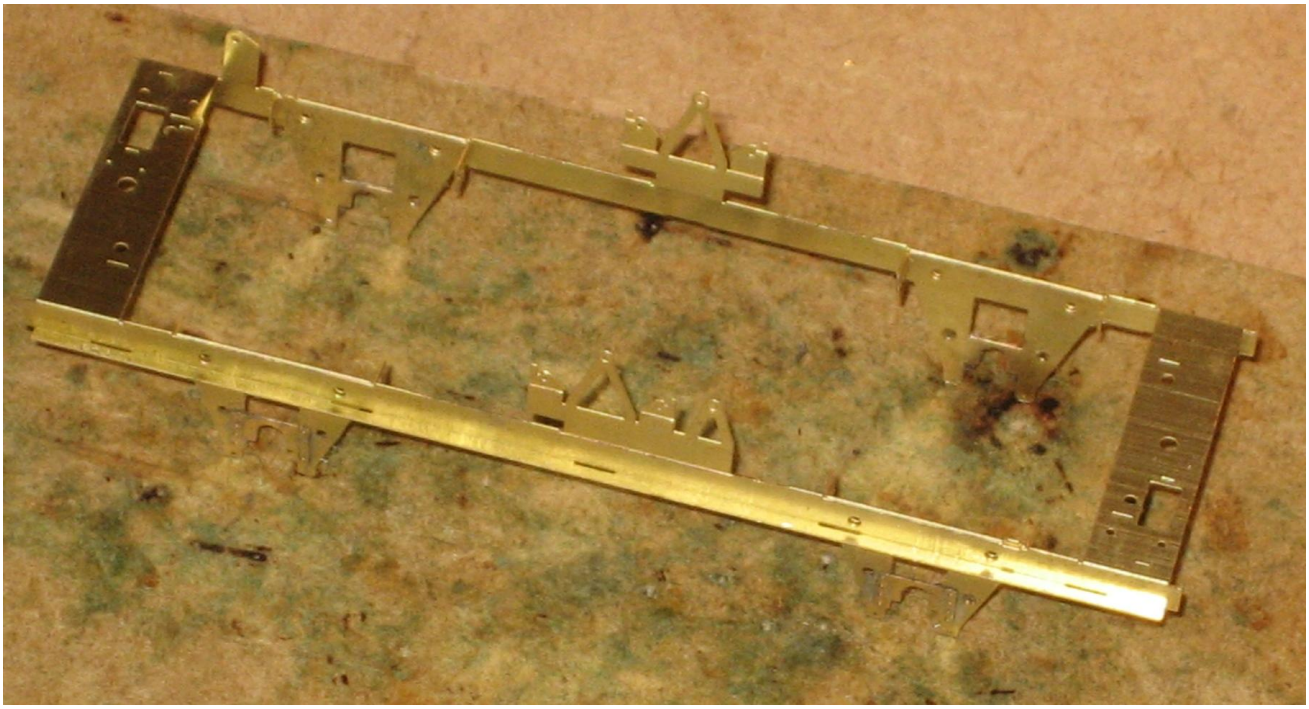
Fold up the outside edges of the axleguard/solebar assembly. These will form the bottom of the solebars. Also fold out the little suspension spring/brakegear supports.



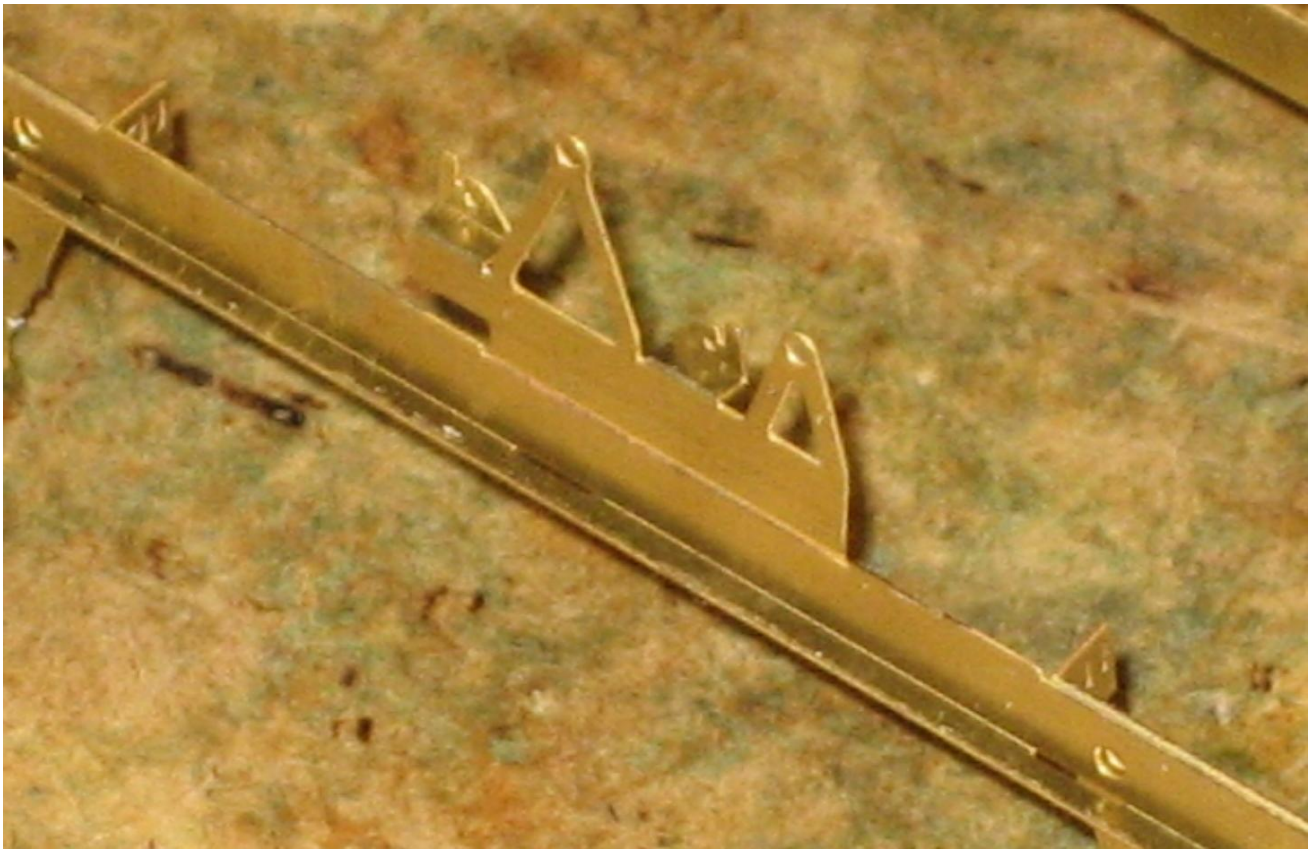
The axleguards need to be folded so that the fold line is through 180° with the fold line on the outside.



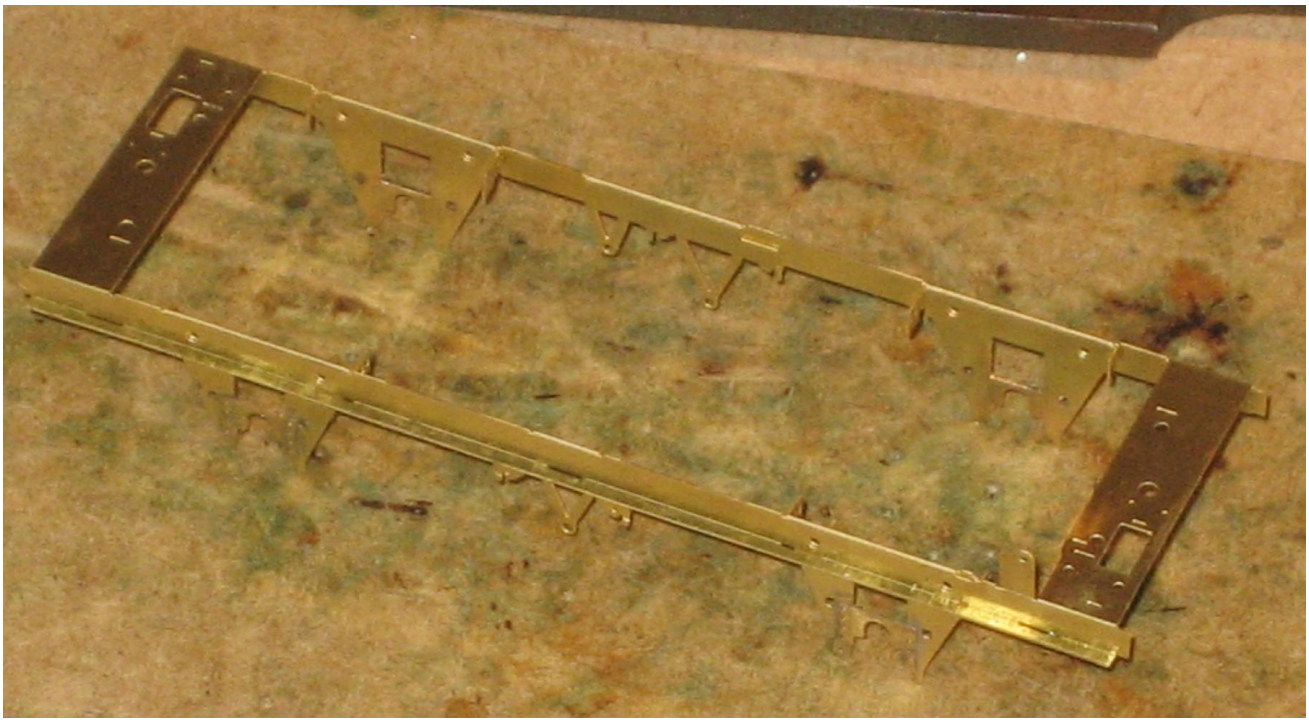
Fold the solebars at the points where they meet the spacers at the ends. It is critical that these folds are all at 90°. If you have a chassis that isn't square it is more than likely due to these folds being unequal.



Fold up the hopper door handle brackets which can be found along with the vees on the centre of the solebar.

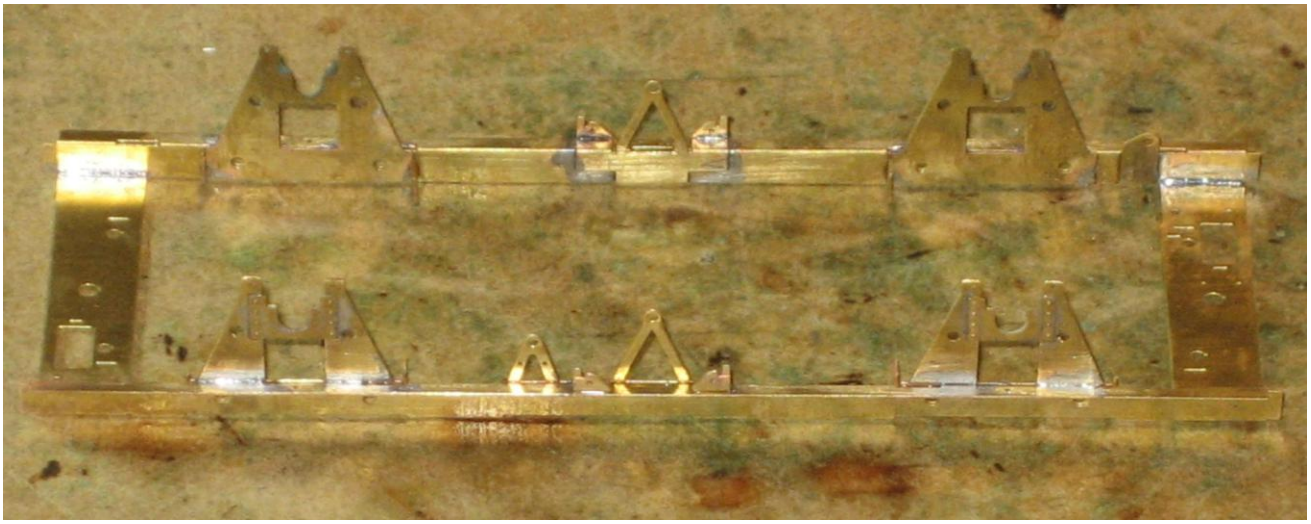


Fold over the vees/hopper door handle brackets in the same way as the axleguards.



If you intend constructing a vacuum braked wagon you will need to fold over the small bracket for the vacuum brake shaft as well. This is the part shaded green on the parts diagram. If you wish to build an unfitted wagon remove this piece.

Reinforce all the fold lines with solder and solder the axleguards and vees to the back of the solebar making sure there is no gap between them.



Remove the solebar overlays (4a or 4b) of your choice. 4a are intended for unfitted and through piped vehicles and 4b for those that had full vacuum brakegear.

As a result of the etching process there should be a curve through them with the ends closer to you if looking at the rivet detail side. Carefully bend them so that the curve is reversed slightly and that the ends are further away when looking at the rivet detail. This can easily be done between thumb and forefinger but take care not to put any folds into it.

Now is probably the easiest time to attach the solebar detailing to the solebars so I shall cover this now before returning to the business of assembling the chassis.

Solebar detailing

The solebar detailing (5) comes contained in its own little fret. See Fig. 2 below. On it you will find fabricated axle spring stops, two sorts of number plates, label clips and a rectangle that is actually a block of wood on the real thing. I have no idea what the purpose of the last item is but it was quite common. The positions of all this stuff varied so check your prototype. Solder the number plates, label clips and block of wood (if required) in place on the solebar overlay.

Note that there are tabs for locating the solebar overlay into the axleguard/solebar assembly and these are on the bottom.

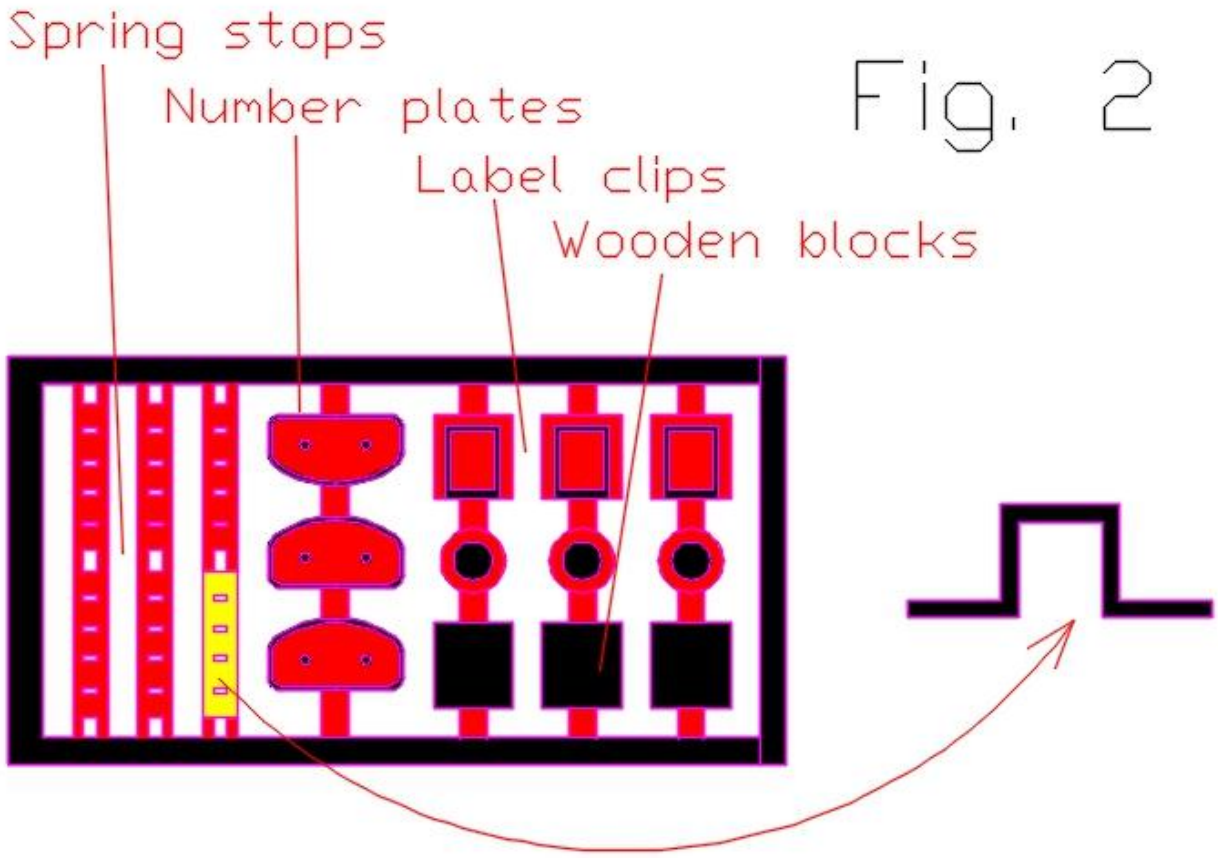
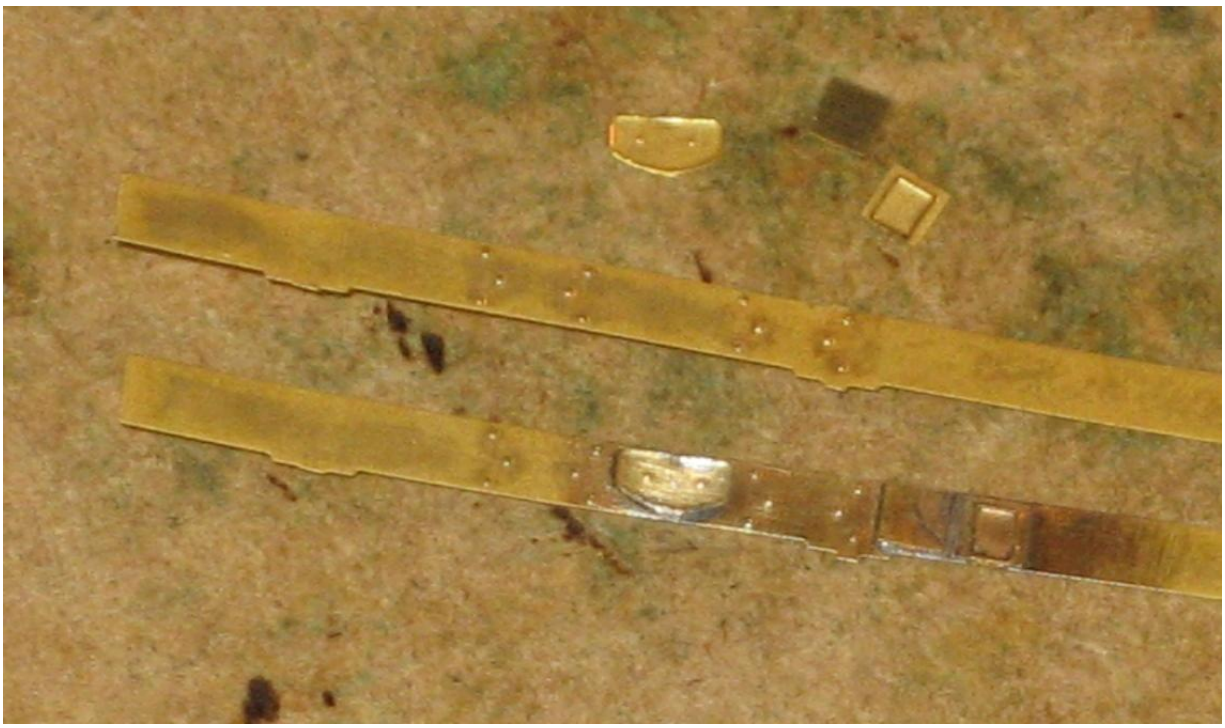
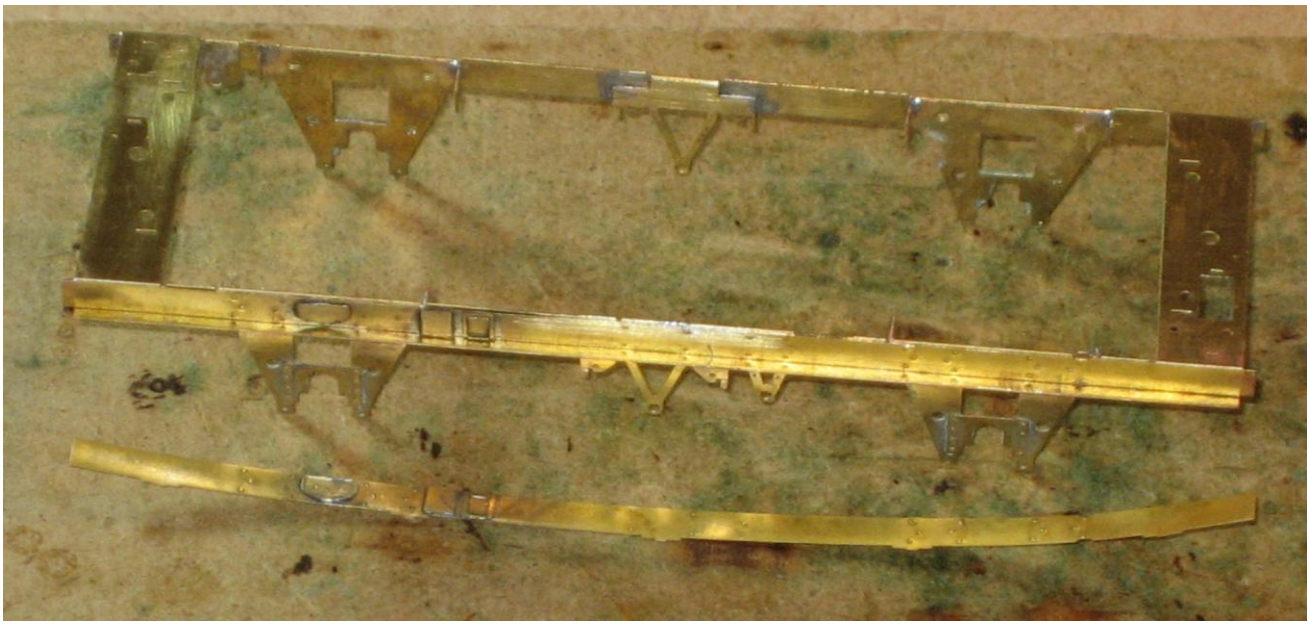


Fig. 2



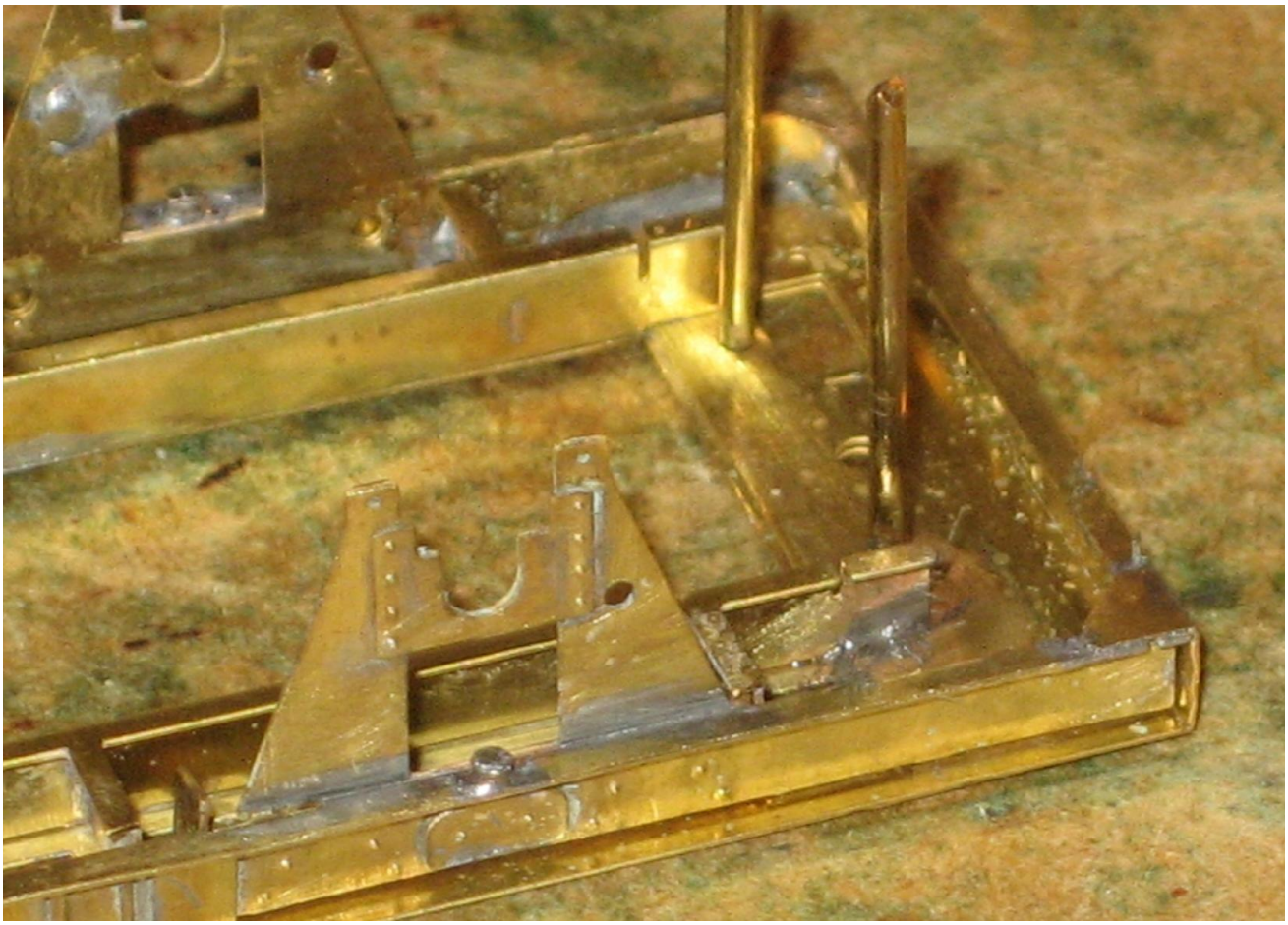
Main Chassis Continued…

Locate the solebar detailing overlay on the axleguard/solebar assembly and tack solder in pace. Note that there is a right way up for all the overlays (if in doubt the notches for the brake lever guards, side support brackets should coincide with those in the solebar) and also a correct side for the solebar detailing on chassis, i.e. the rivets in the centre of the detailing should line up with the vees. See Fig. 1a or 1b if you are unsure. Do one solebar at a time and lightly solder in place once happy with the fit.



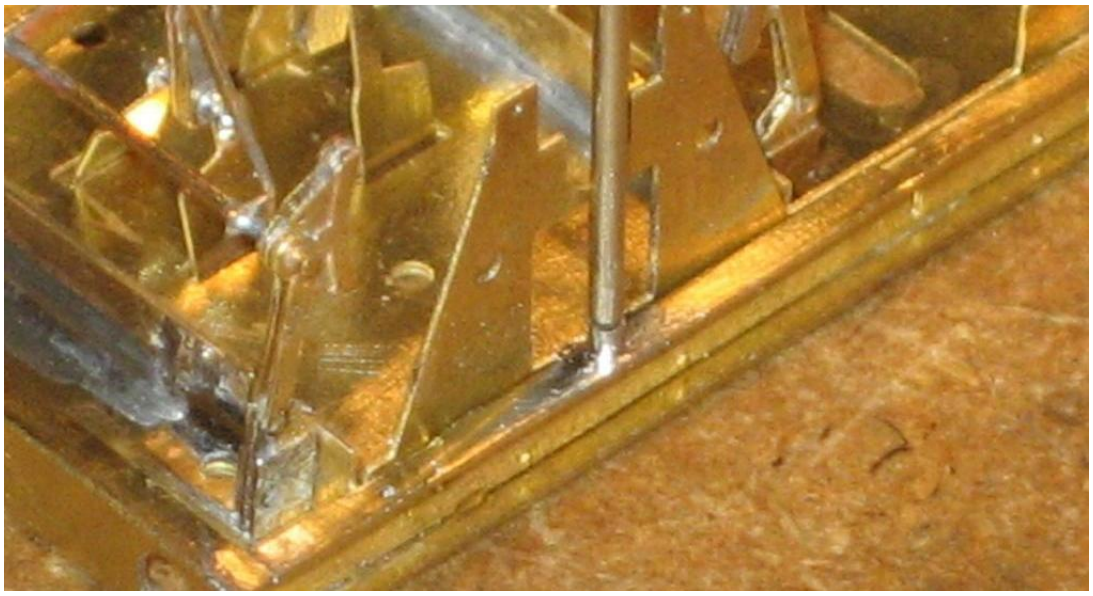
The chassis top plate and the axleguard assembly then need to be soldered together. There are 1mm diameter holes on both the top plate and axleguard assembly to aid location. Use the locating holes on the chassis top plate to drill four holes into a scrap piece of wood. This will aid construction of the chassis from this point. Slide the axleguard/solebar assembly into place on the chassis top plate. Using short lengths of 1mm wire, with the ends tapered slightly, pin the two parts together and onto the piece of wood. You may need to open out the holes in the chassis parts slightly but make sure the wire is a tight fit. Leave in place on the piece of wood for the moment. See the photo at the top of the next page.

The corner plates (18) can also be added now. They are simply a triangle to reinforce the solebar/headstock joint. The angled part should face towards the inside of the wagon. Again see the photo below.



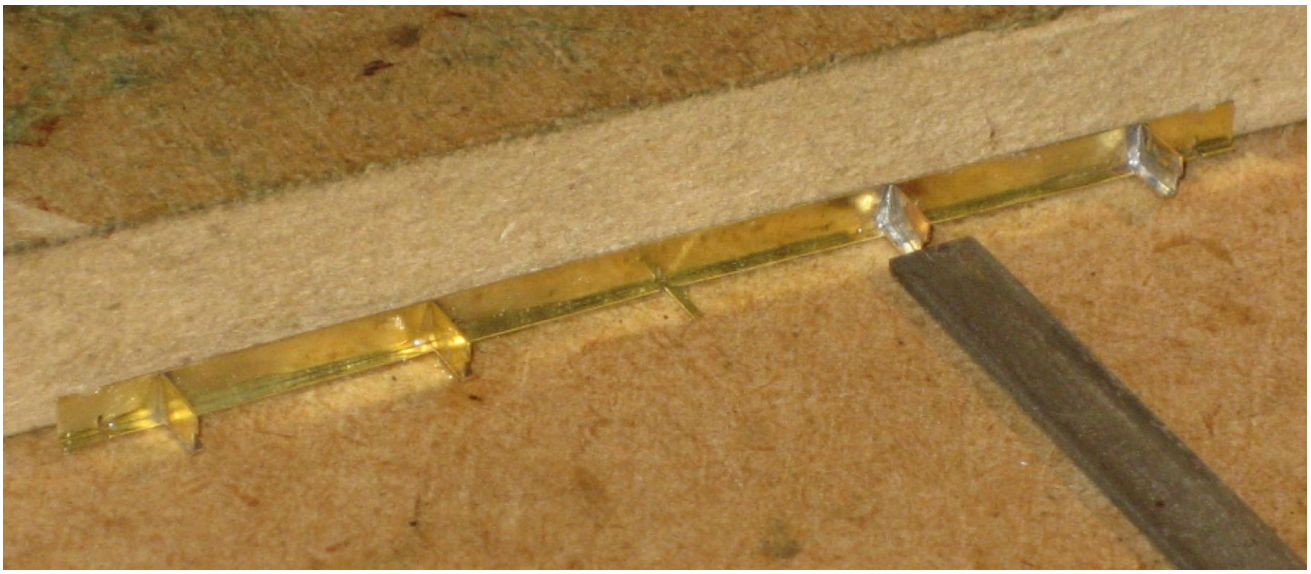
Spring Stops

There are 6 fabricated spring stops on the solebar detailing fret (see Fig.2) which can be folded up and then soldered in place. I find a small pair of self closing tweezers good for this. Some wagons had round pattern spring stops. I use 1mm wire for these. I cut almost all the way through the wire with a piercing saw and then solder in place. The cut can then be completed without the soldered joint breaking and the top gently filed flat.



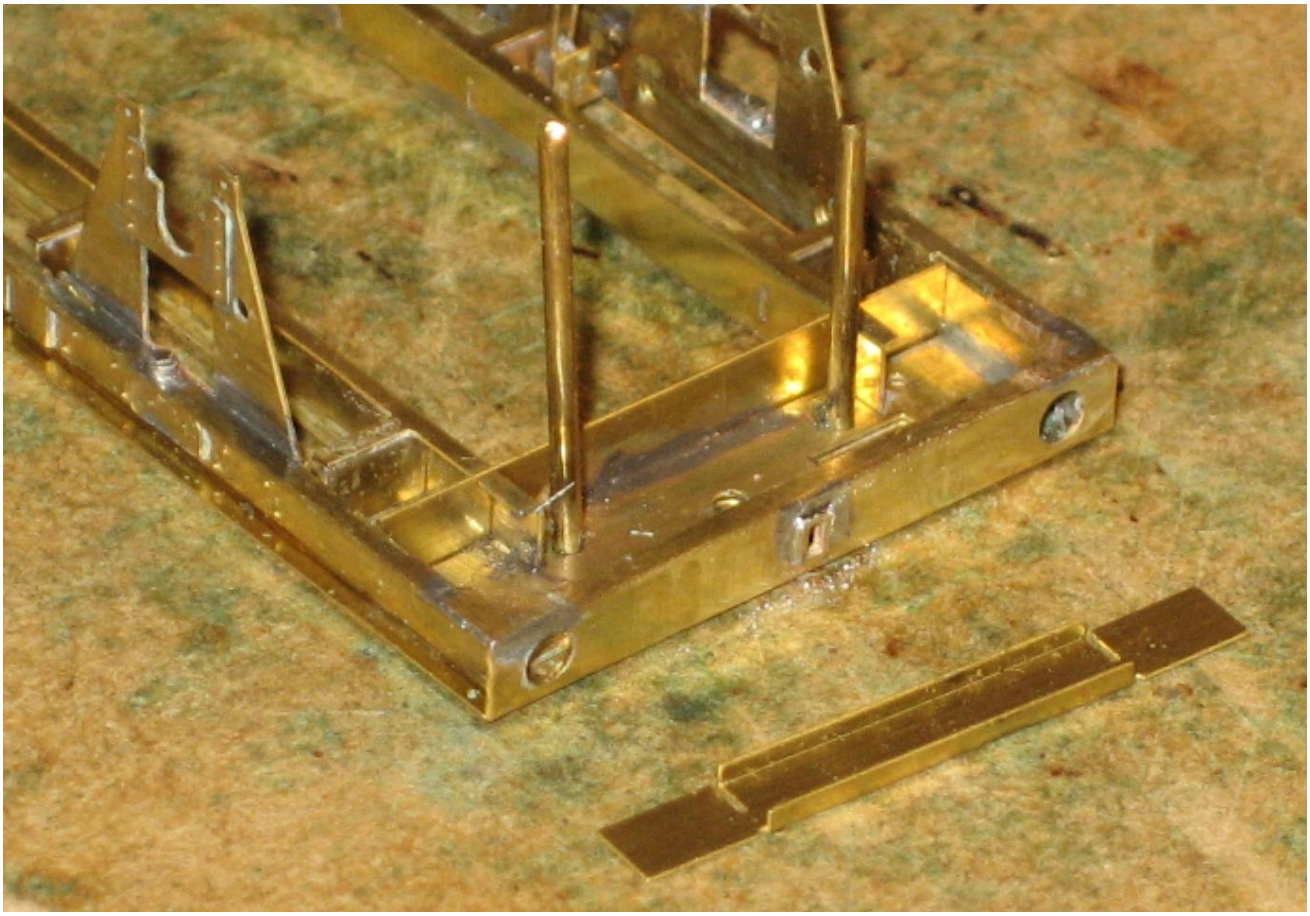
Chassis Framing

Remove the longitudinal bracing (6) from the fret and fold into an L shape. Remove the short cross bracing pieces from the fret and solder in place on the inside of the now L shaped longitudinal bracing. Note that there are slots and tabs to aid this procedure. I found it useful to hold everything against a piece of wood that was securely fixed in place and to use a file to ensure the cross bracing stayed where it should be.



Once they have been assembled these longitudinal framing parts can be located in place on the chassis. There are tabs and slots to assist with this. Tack solder in place at the ends. Note that there is a correct side for these and that the centre cross pieces on the longitudinal framing and the chassis top plate should match.

Remove the long end cross bracing (8) and the long centre cross bracing (9) from the fret. Fold the long centre cross bracing into a channel. Using the slots provided locate in place on the chassis. If you are constructing a vacuum braked chassis you will need to remove 0.25mm from the end of one of the long end cross bracing pieces where it comes into contact with the bracket for the vacuum cylinder shaft.



Solder everything in place making sure that the axleguard/solebar assembly and the longitudinal framing are accurately and securely fixed to the chassis top plate.

Brake shoes and brakegear

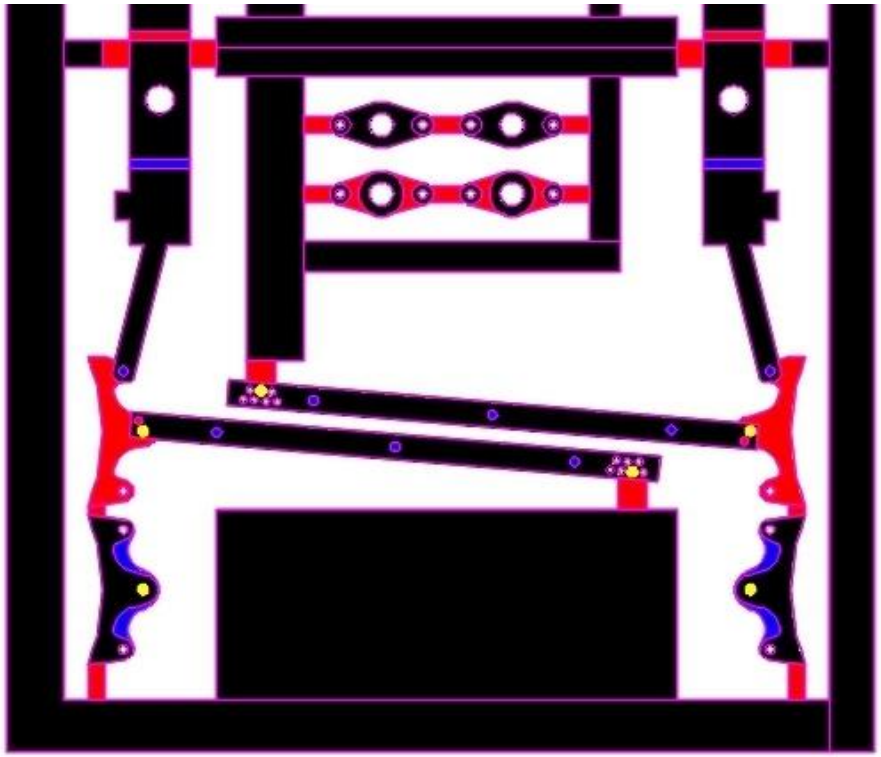
The brake shoes (10) are etched with integral push rods are designed to be folded up as one piece, soldered together and then tidied up afterwards. The whole assembly is soldered to the chassis and then the cranks can then be added. They are rather delicate until folded up and soldered together so take care. Once assembled though they are quite robust so don't be afraid to tweak them to get them to line up properly on the chassis. The shoes are deigned to be in line with the edge of the flange on Exactoscale wheels.

You need to make sure the appropriate holes in the brake shoes can accept 0.31mm wire as this will be used to align/pin everything. Refer to Fig. 3 below. The holes that need to be able to accept the wire are marked in yellow. I have shown one side of the Morton cam set and non- Morton cam or independent set. The other side is simply a mirror image.

It is best to do one set at a time leaving the others on the fret. This will avoid mixing parts up. Those sets intended for the lifting link side of wagons are marked on the fret with a big M.

If you wish press out the half etched rivets at the top of the hanger bracket and along the push rod. I use a drop head rivet press for this with the parts held on one of those ubiquitous green cutting mats. This will distort the push rod so you will need to straighten it once you've removed the part from the fret.

Remove from the fret and fold the brakes up. The following photographs will provide an illustrative guide. There are two parts to each side of the brake shoes, one half etched and one full thickness. The full thickness parts will go in the middle of the shoe and need to be folded so that it is on the back of the half etched part. In order to do this successfully you must hold the half etched part with a pair of pliers so that the pliers are hard up against the full thickness part or they will end up misaligned. Once the fold is nearly complete thread a length of 0.31mm wire through the holes in the brake shoes and use the pliers to clamp the two parts together. The wire will ensure the parts are properly aligned. All this is much easier than this makes it sound. Repeat for the other side.



Non-Morton clutch
or non-lifting link side

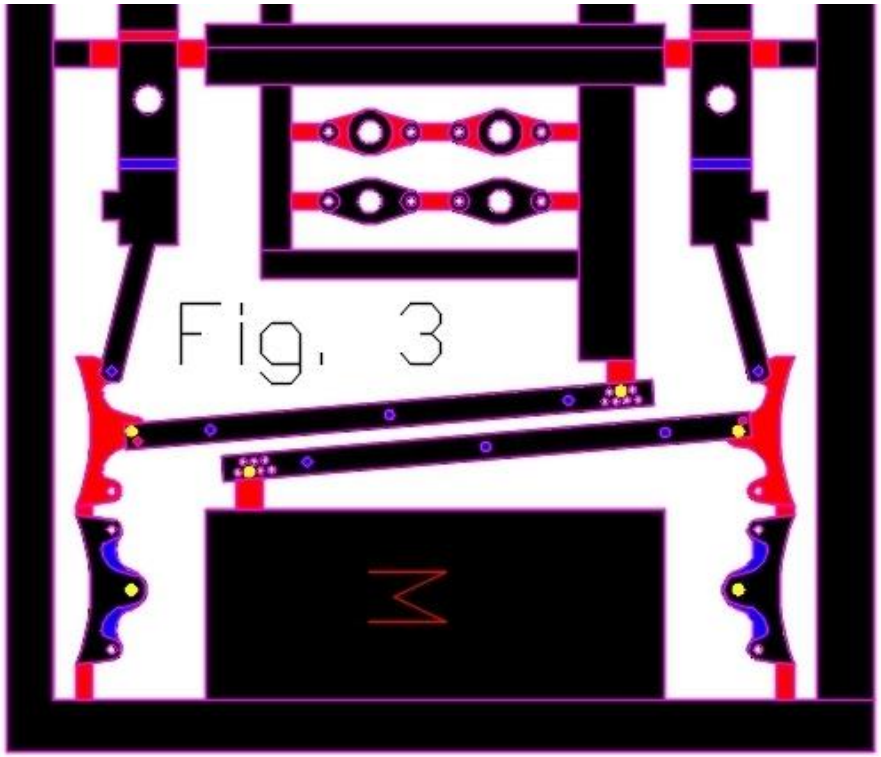
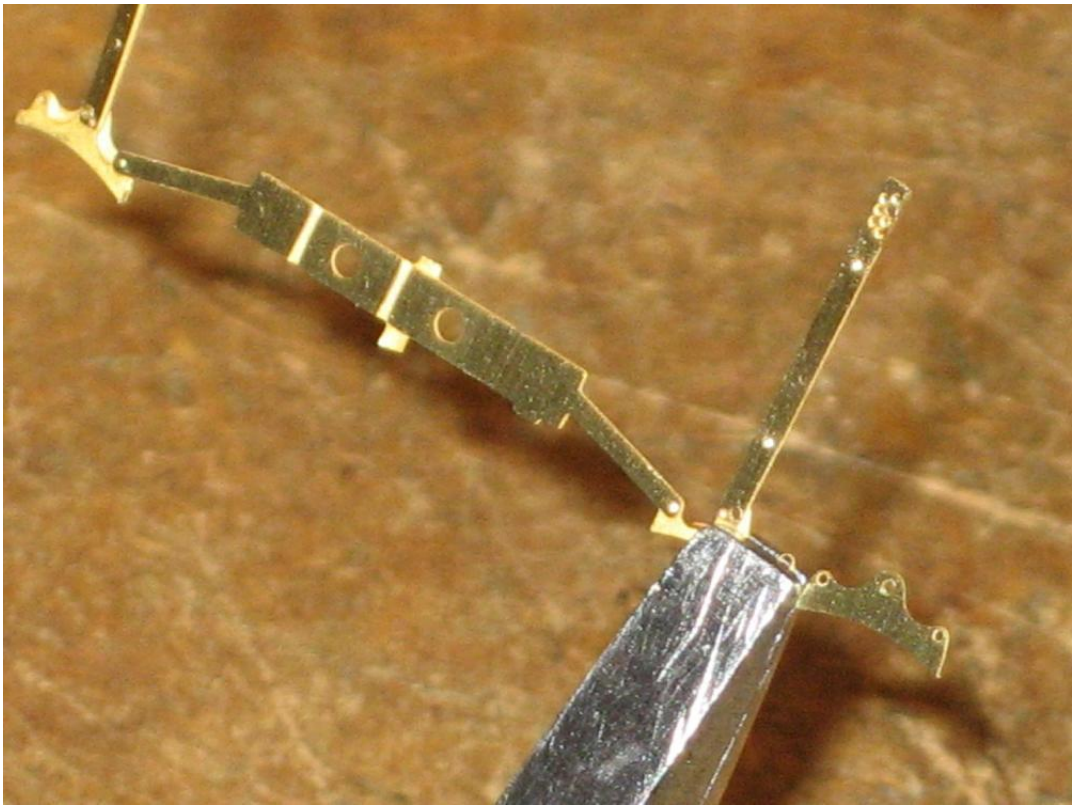
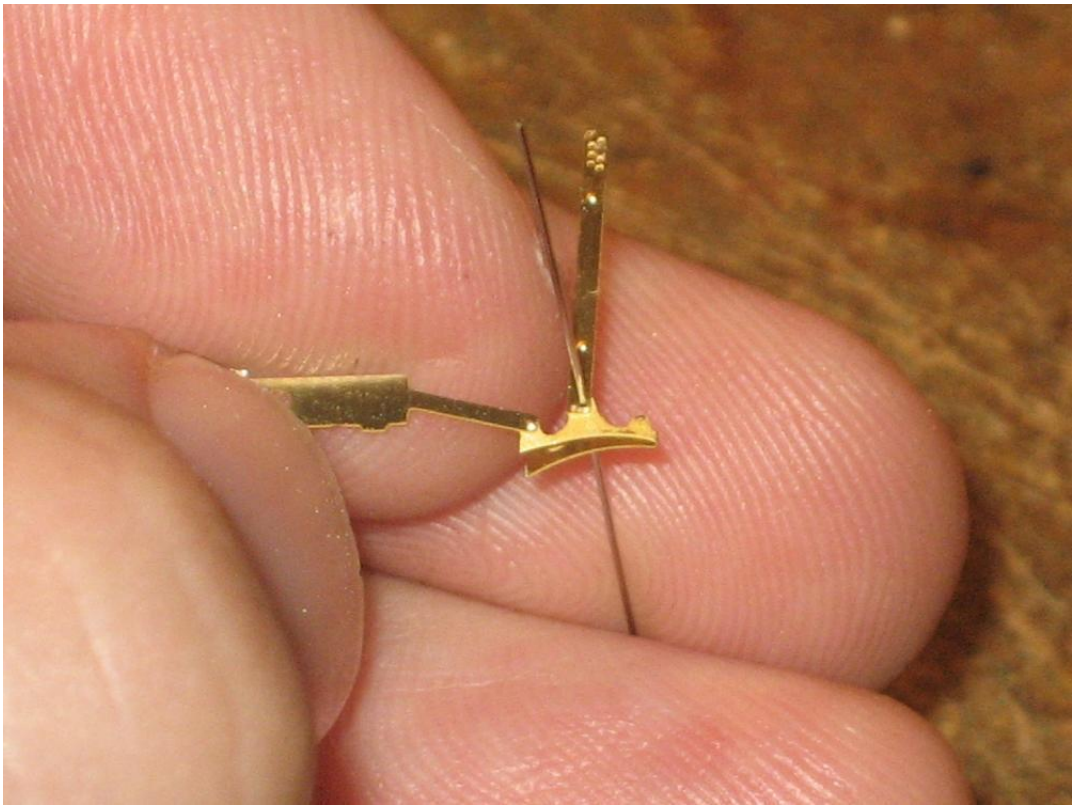


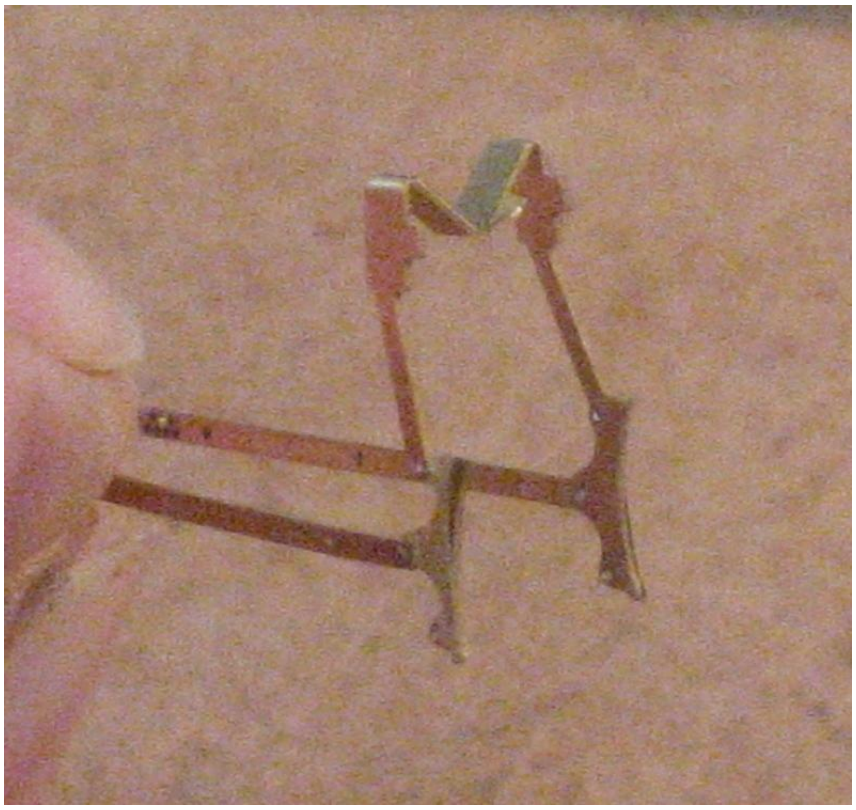
Fig. 3

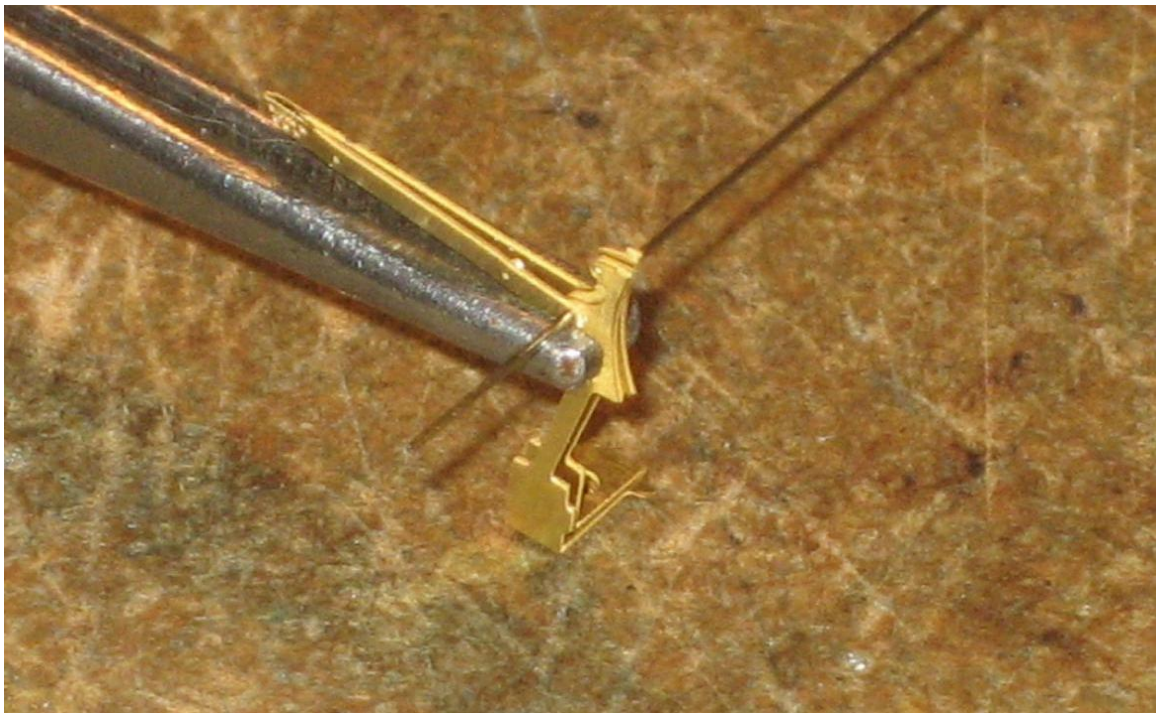
Morton clutch or
lifting link side

This brake shoe assembly then need to be folded up. There are three fold lines in the centre of the assembly. These all need to be folded through 180° with the fold line on the outside. This will produce a concertina type effect. A length of 0.31mm wire can be used to make sure the brake shoes are aligned and then the brake shoes clamped and solder together. The wire can be soldered in place at the same time and then trimmed to represent the bolt that is there on the prototype.

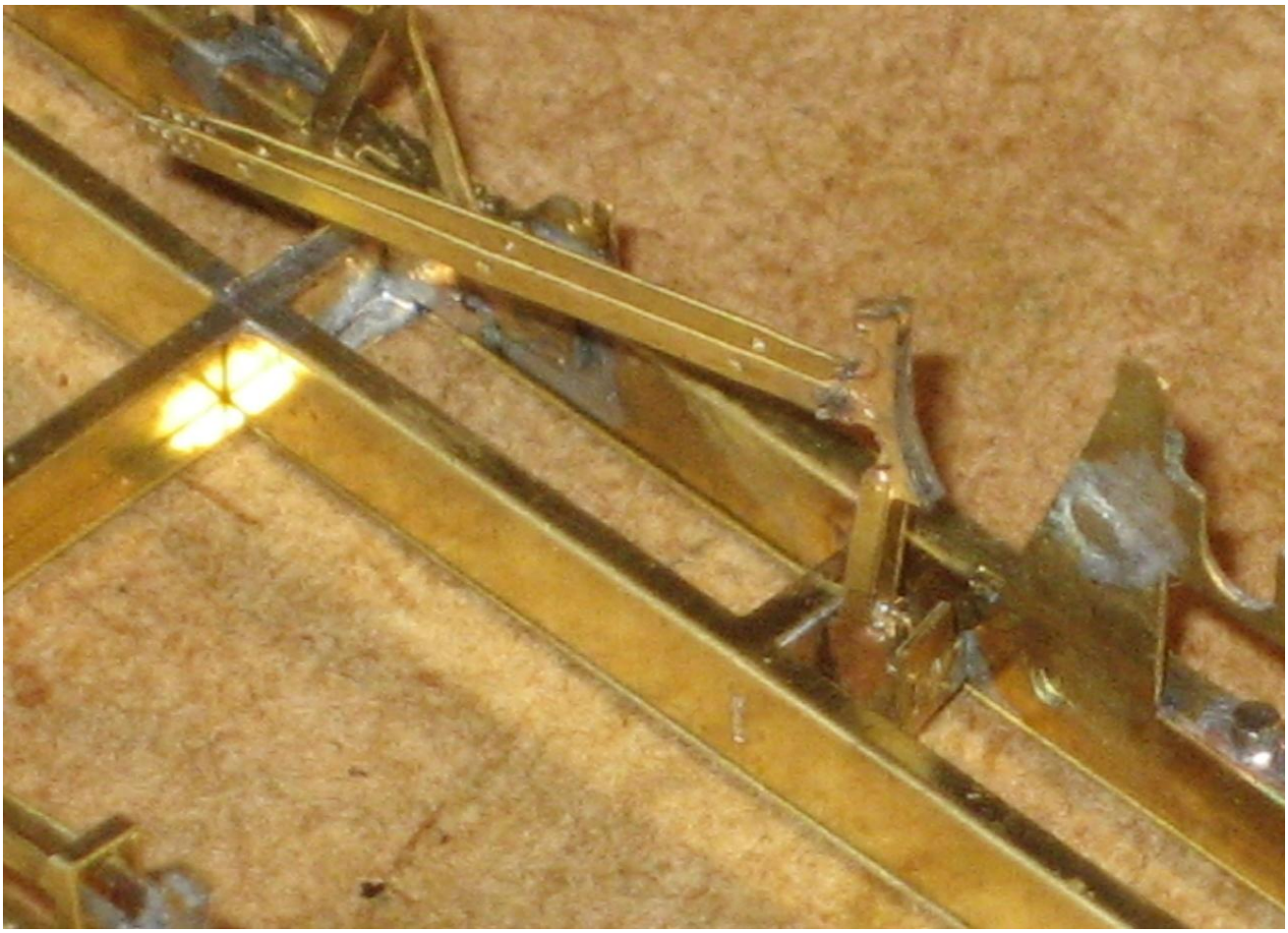








There are two tabs on each of the brake shoes that locate into slots in the axleguard/solebar assembly (2). Note that one tab is longer than the other. The longest tab goes towards the inside of the wagon. You will need to angle the locating wings on the axleguard/solebar assembly in order to fit them. Use the longer of the two tabs to locate the brake shoe in place and then return the wing to its original position at 90° to the solebar. Solder in place against the wing and the longitudinal framing. Make sure that the brake shoes go in the correct place. Refer to prototype pictures, Fig.1a or Fig.1b to be sure.



Repeat the process for the other brake shoes.

The push rod cranks (11) need to be tackled next. There are two sorts of push rod cranks. One set have half etched areas to match the profile of the prototype and the other are solid. You will need two cranks for each set of brakegear.

Make sure that the main hole in the push rid cranks can accept 0.8mm wire and the smaller holes 0.31m wire. Whilst still on the fret use one of the cranks to drill two 0.3mm holes into a piece of scrap wood. This jig will be used to solder the two parts of the crank together. Solder the wire in place at the same time. See photo below.

Once complete trim the wire so that it extends approximately 1mm either side of the crank. The crank can then be fitted to the push rods by gently prising the push rods apart and locating the wire into the holes. Generally the push rods end up tapering towards each other so I don't worry about soldering the crank to the push rods or indeed to the brake shaft.

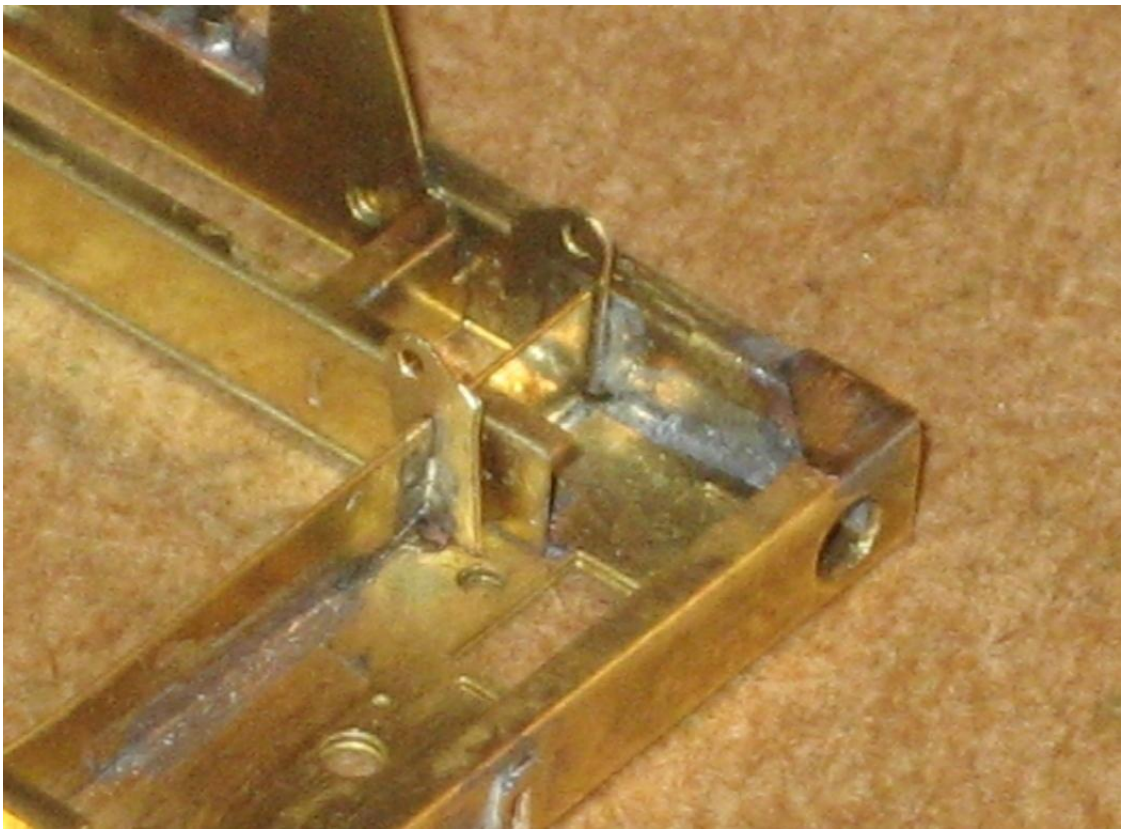
Safety Loops

The safety loops (10) can now be folded up and fixed in place. All the fold lines are through 90°. You will need to open one of the folds out slightly in order to get them around the push rods. They should go on top of the cross section just to the inside of where the brake shoes locate. Solder in place. Don't worry of they're a bit wonky most of those fitted to the real thing were!

Vacuum brakegear

If you are building an unfitted chassis you can quite happily skip the next section. If not read on…

Remove the inner vacuum shaft bracket (13) from the fret and tidy up. This bracket needs to be located at the end where the vacuum shaft bracket is on the solebar. There are slots and tabs to aid location. Solder in place.



Make sure that the holes in the following items can accept the correct size of wire then remove from the fret.

Vacuum cylinder crank (15) - 0.4mm & 0.7mm
Vacuum cylinder crank overlay (16) - 0.4mm
Vacuum shaft link (17) - 0.4mm, 0.7mm & 0.8mm
Vacuum shaft link overlay (18) - 0.4mm

The vacuum cylinder crank overlay (16) needs to be folded around and then soldered in place on the vacuum cylinder crank (15). Use two lengths of 0.4mm wire to aid this alignment, solder together and the trim the wire to represent bolt heads.

A similar procedure needs to be carried out with the vacuum shaft link (17) and the vacuum shaft link overlays (18). There are two different overlays which need to be wrapped around the link and then soldered in place using 0.4mm wire to locate them. Fig. 4 below shows the whole arrangement.

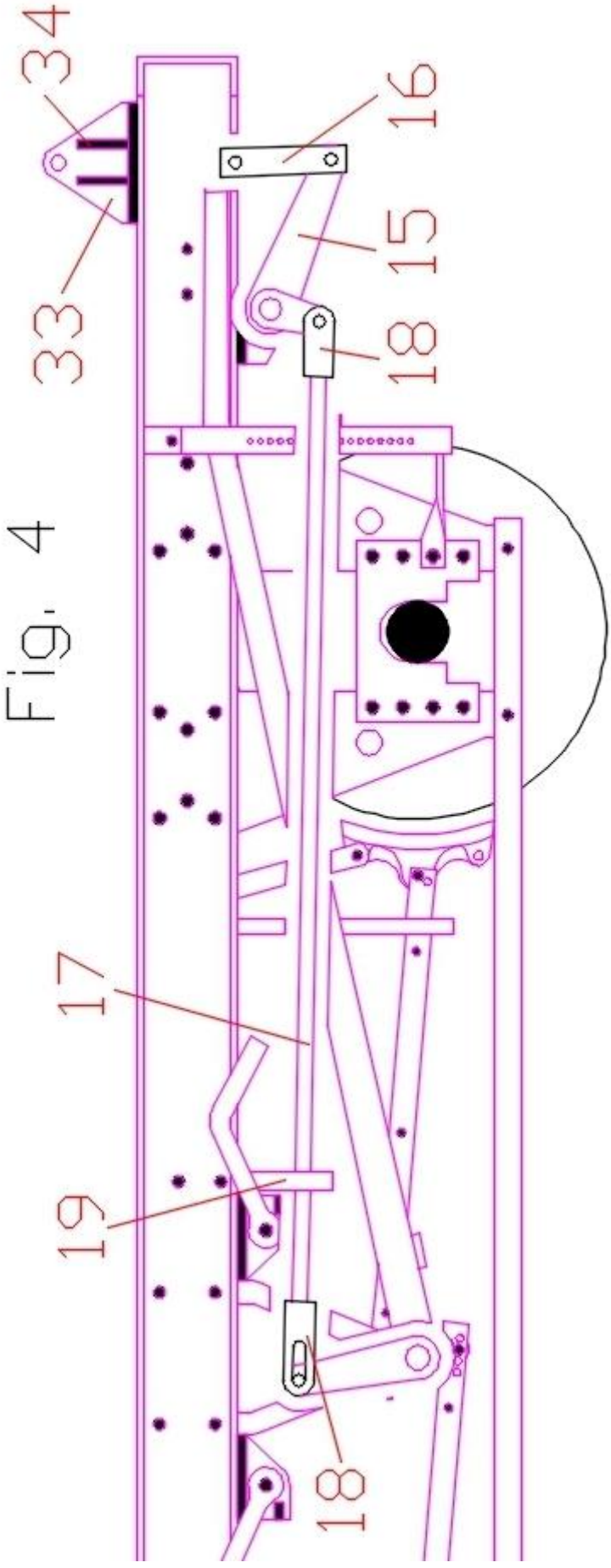
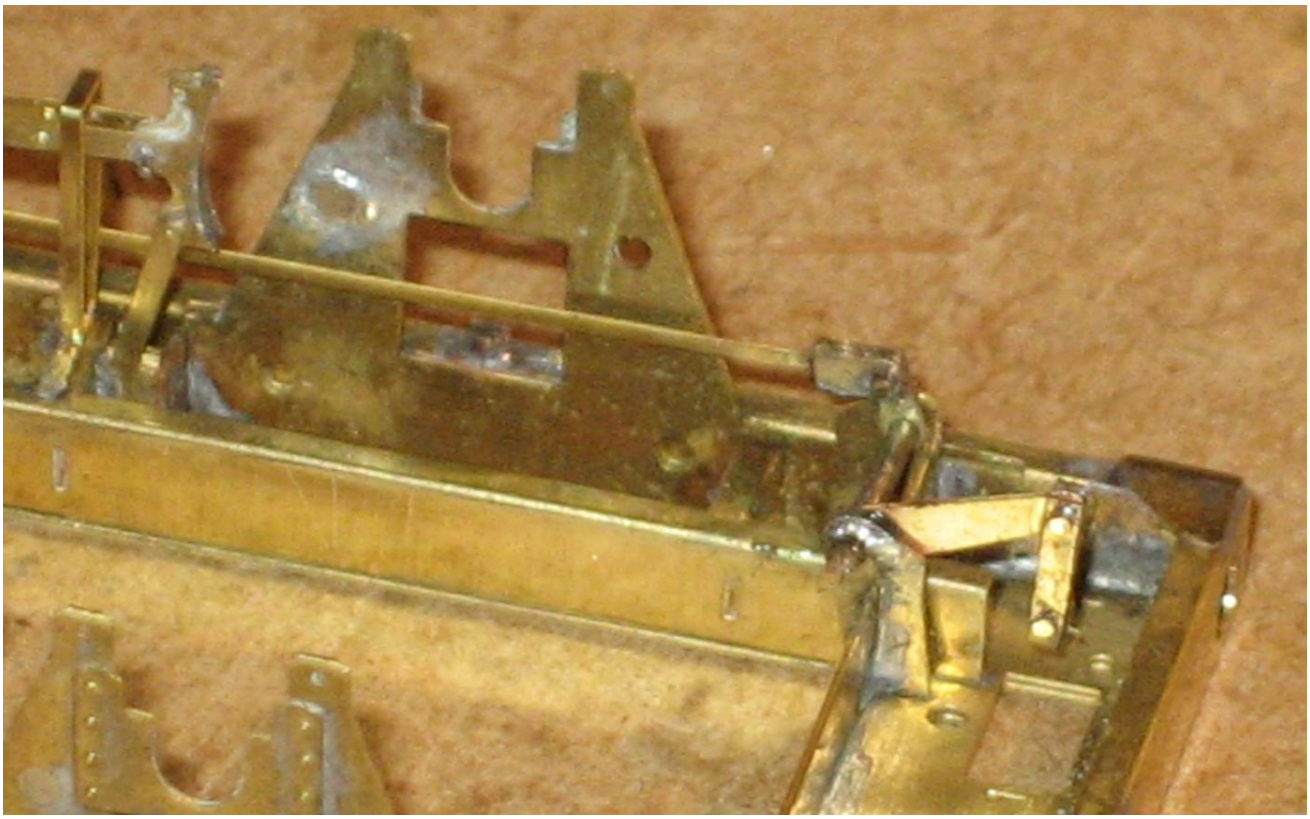


Fig. 4

The two vacuum brakegear assemblies can now be fitted to the chassis. You will need to fit them with a short length of 0.7mm wire as shown below. Leave approximately 0.5mm of wire on the outside of the chassis and solder the wire to the inner bracket and the vacuum cylinder crank to the shaft at approximately the same position and angle as below. Leave the link free for the moment. Note that the link goes outside of the brakegear and safety loops and inside the axleguard.



The outer vacuum shaft bracket (14) can be tackled next. There are two versions of this, an easy one and a fiendish one. There are two half etched rivets that can be pushed out on the easy one and then it simply folds into an L. This can then be located using the vacuum cylinder shaft onto the underside of the solebar and soldered in place. The fiendish version is similar but has two tiny little pieces that locate into slots on the bracket. 0.31mm wire will then be needed to represent the bolts that hold the bracket to the solebar on the real thing.

The safety loops for the vacuum link can be added now. These are a right pain as I couldn't find a simple way to arrange location onto the back of the solebar. They fold up in a similar manner as the safety loops for the brake pushrods with all the fold lines through 90°. They need to be wrapped around the vacuum shaft link and then soldered to the back of the solebar hard up against the vee/hopper door handle part. They should look something like the photo below.

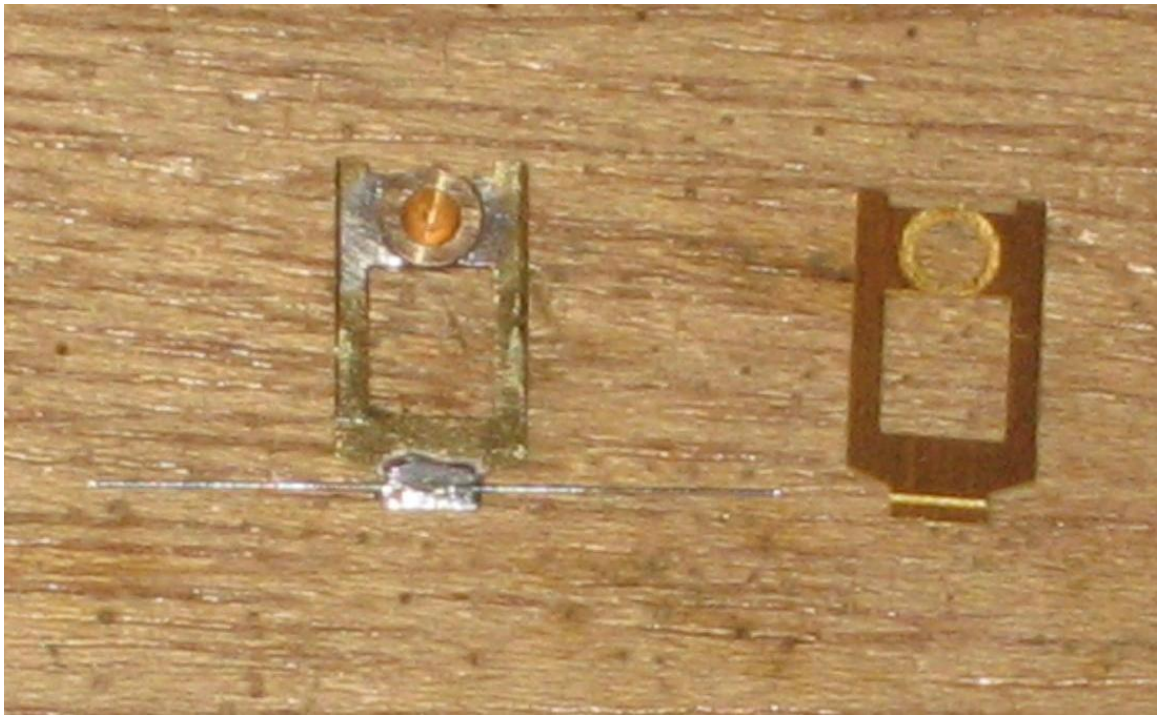
Spring Carriers

The spring carriers (20) can now be assembled. They are designed so that the springing wire is soldered to the carrier using the half etched slot as a guide. As mentioned in the preamble a suitable flux will be necessary. I use Carr's Black Label.

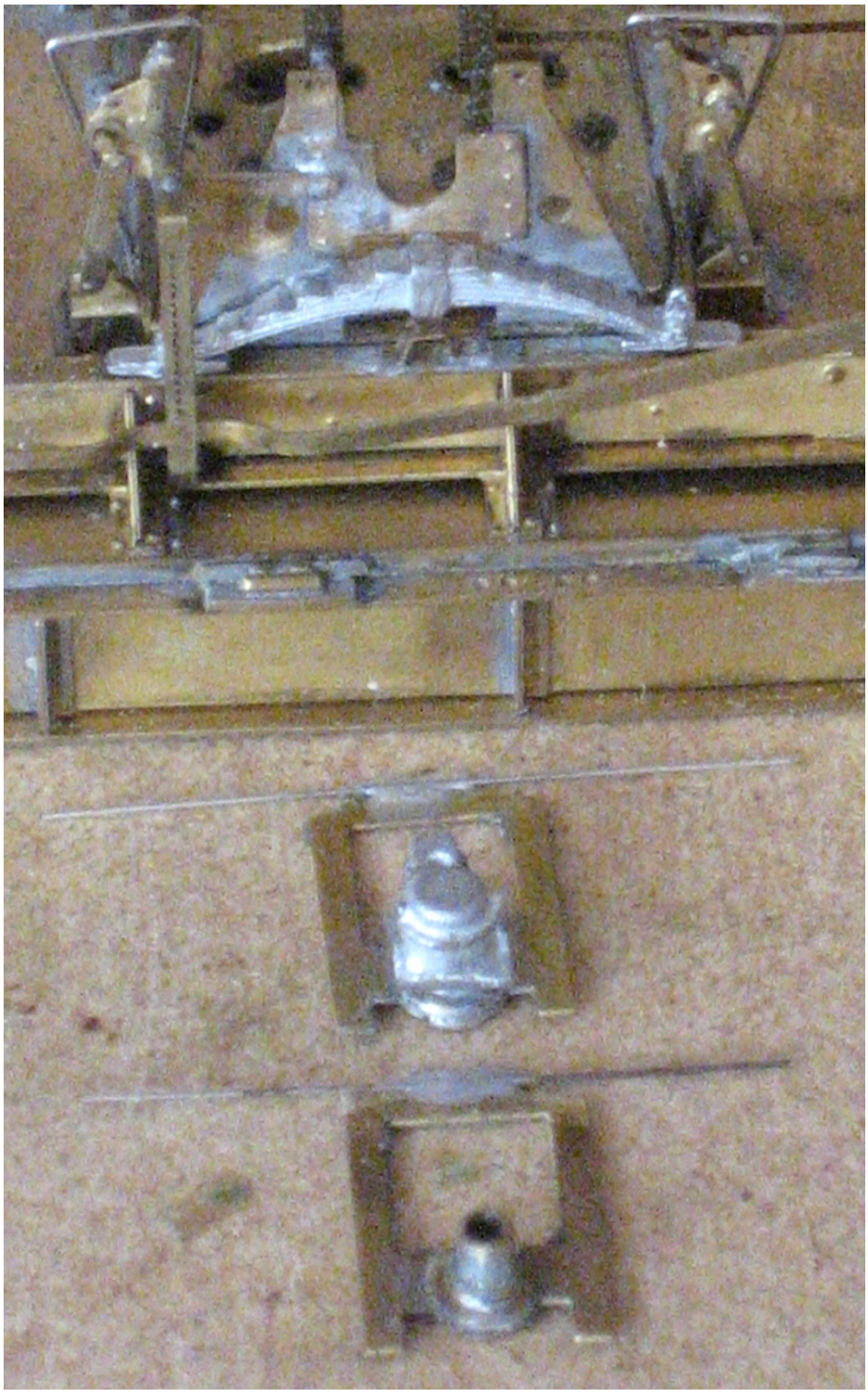
The distance between the backs of the axleguards is a tad larger when compared with other systems and works out at 24.5mm. This is deliberate and I make no apologies for it. The advantage of this measurement is that if using pin point axles you don't have to hunt around for bearings that are deep enough but you may find that the carriers need packing out a little to take up any slop. Bearing washers (21) are included for this purpose. There should be a good fit between the axles and the bearings with ideally no sideways movement at all. If using pinpoint axles use a waisted type of bearing to avoid having to remove any more material form the cast axleboxes than is necessary. I have used Exactoscale waisted pin point bearings which are just about perfect for the job with only occasional ones that require packing out.

Due to the removable nature of the tiebars you can easily use Exactoscale parallel axles and bearings. If doing so then you will need to pack the bearings out on the back of the spring carriers before soldering them in place due to the length of the axle. Use the bearing washers provided. I have built chassis with Exactoscale parallel axles and used one half etched washer and one full width washer to pack the bearing out. This leaves the outer edge of the bearing 0.25mm beyond the axleguard and provides 1mm of bearing surface for the axle.

I find the easiest way to assemble the spring carriers is to make a small jig consisting of an off cut of wood with a 2mm hole drilled into it. The spring carrier can then be placed so the half etched guide slot for the spring is facing towards you and the bearing locates through the hole in the carrier and the wood. The bearing can then can be soldered in place. The spring wire can then be located in its half etched guide slot and soldered in place using a suitable flux. I use Carr's black label. The spring wire needs to extend at least 7mm either side of the point where it is attached to the carrier.



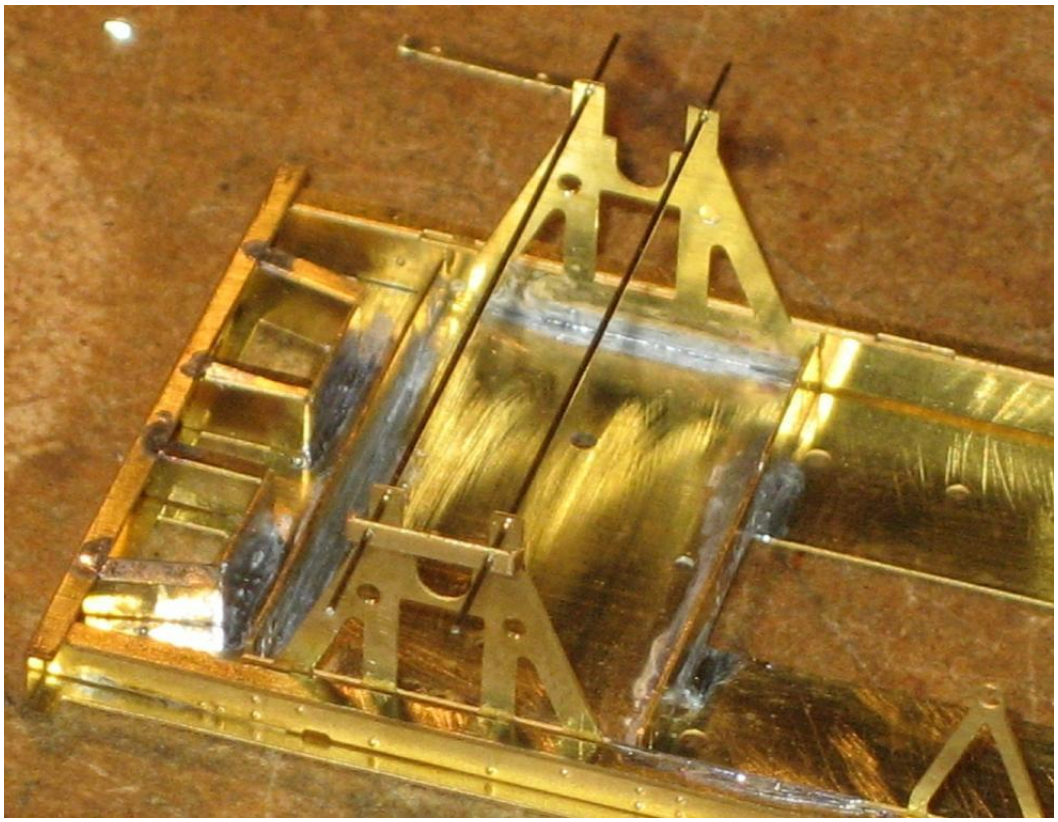
A note on roller bearings: These were fitted to new to several lots and were retrofitted to many more both fitted and unfitted. My preferred method of doing this that is to extend a parallel bearing using a length of 1.5mm x 1mm brass tube approximately 2mm long and then gluing the axlebox casting to this. The axlebox will then move up and down with the spring carrier. If you use this method you will need to make sure there is sufficient clearance between the axlebox and spring castings and will have to make the tiebars removable if you ever want to get the wheels out again. Wizard Models make a suitable hooded type roller bearing axlebox casting as well as other non-hooded types. The type used varied so check your prototype.



Tiebars

There are tiebars (22) included which are designed to be removable if you wish in order to allow the wheel sets to be easily dropped out. They can be soldered permanently in place but either way you will need to make sure the holes will accept 0.31mm wire before removing them from the fret.

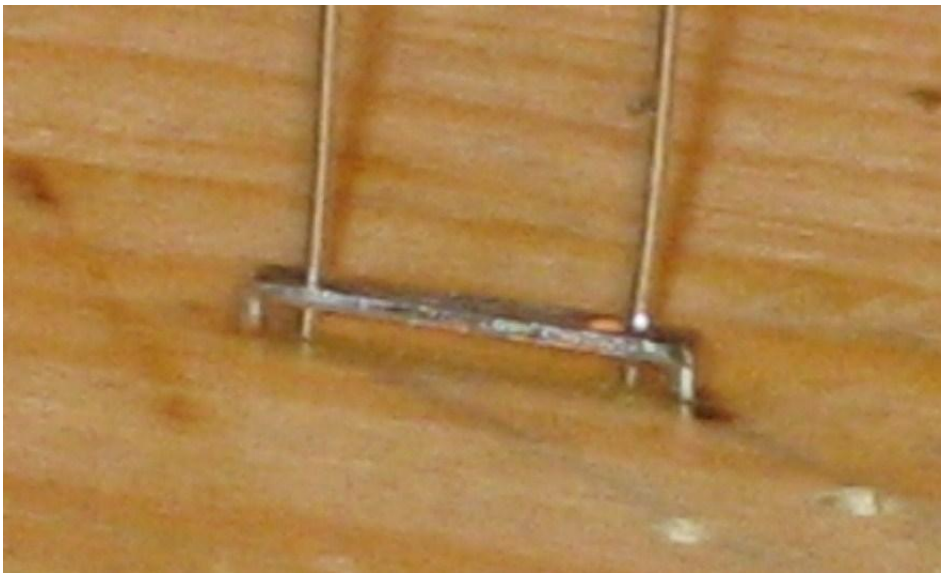
If you are not planning on making them removable then they can be pinned and soldered to the axleguards. Remove from the fret and fold the ends up. Thread lengths of 0.31mm wire through the tiebar and holes in the axleguard and the corresponding holes on the opposite axleguard. Solder in place. Fit the other axle guard and solder in place. Trim the wire so that it represents bolt heads on the tiebars but extends approximately 0.5mm from the back of the axleguard. These pins will prevent the springs from becoming disengaged from their slots.



If you want to make them removable to allow the axles to be dropped out then you will need to solder 0.31mm pins through the holes in the tiebars. I find the easiest way of doing this is to use one pair of holes as a jig and drill a pair of 0.3mm holes into a piece of scrap wood. Short lengths of 0.31mm wire can then be threaded through the axle guards locating into the holes in the wood. These can then be soldered in place and filled back to represent bolt heads before folding up the ends.

Fold the ends and locate two short lengths of 0.31mm wire through the holes and into the holes drilled into the wood. Solder the wire in place and whilst still pinned to the wood file the wire back to represent bolt heads. Remove and trim the other end of the wire. You will need to make sure there is at least 0.75mm of wire projecting from the back of the tiebars otherwise the spring carriers will be able to fall out of place when everything is assembled. It is also a good idea to leave at least one of the pins in the axle guard as long as possible to give you somewhere to hold them when painting. Once the tiebars and the chassis are painted they can be tack glued together on final assembly.

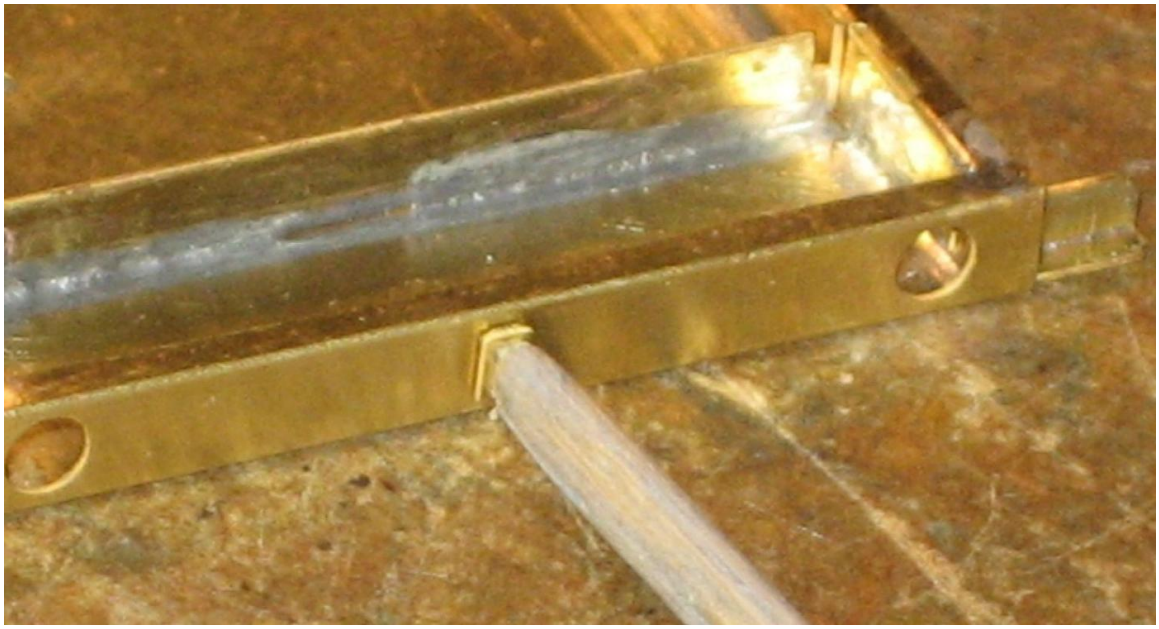
The glued joint can be broken and the tie bars removed if you find it necessary to remove the wheels at any point.



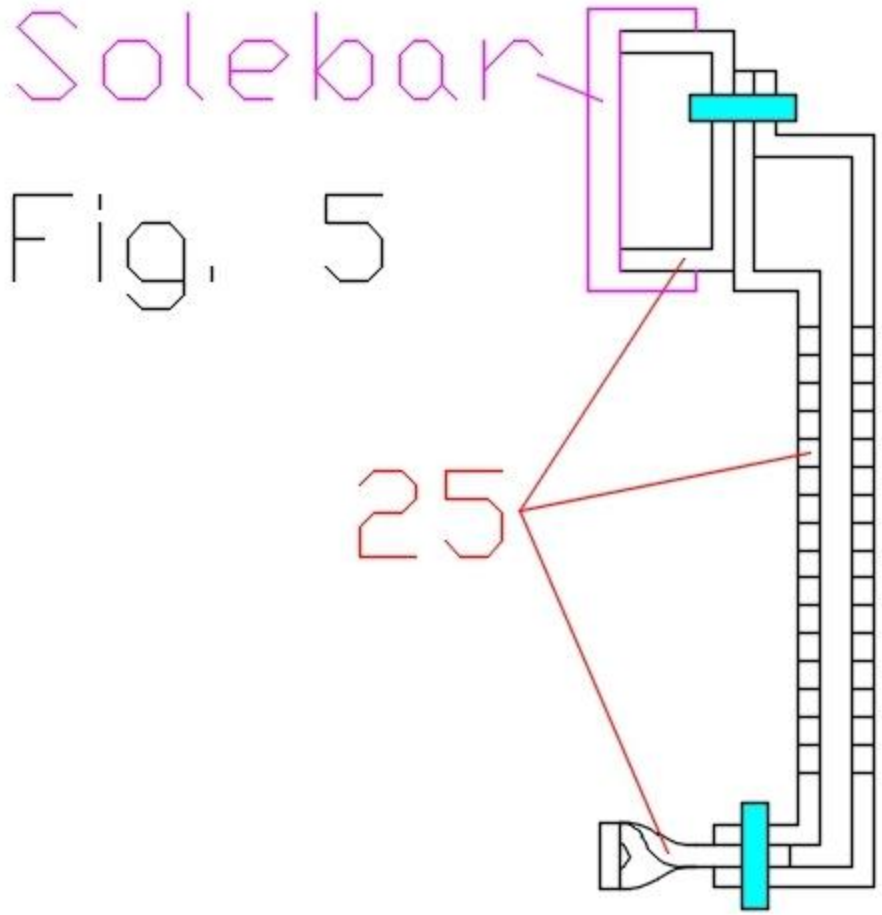
I find long tiebars are quite fragile on their own and so reinforce the back of mine with 0.31mm wire. There are slots etch on the back of the tiebars to help with this. This makes for a much stronger part.

Headstock detailing

Now is as good a time as any to fit the coupling pocket detail (23). There are up to two types depending on the chassis, riveted and welded. Check your prototype. Generally riveted chassis has riveted coupling pockets and welded chassis had welded coupling pocket but not always. The vast majority of the wagons that had this particular chassis had the welded type. Solder in place using the hole for the coupling as a guide. I find the easiest way of doing this is to shape the end of a cocktail stick to fit in the slot. This can be used to align the detail on the headstock and hold it in place while you solder them together

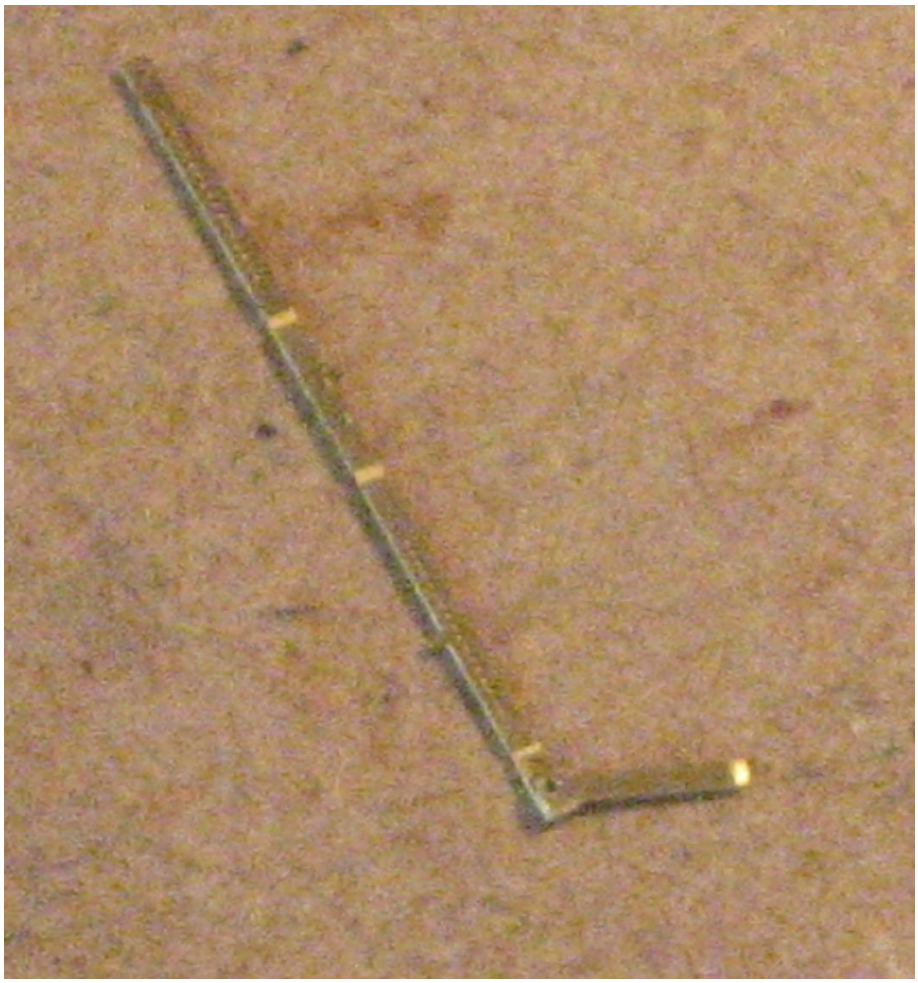


Brake Lever Guards

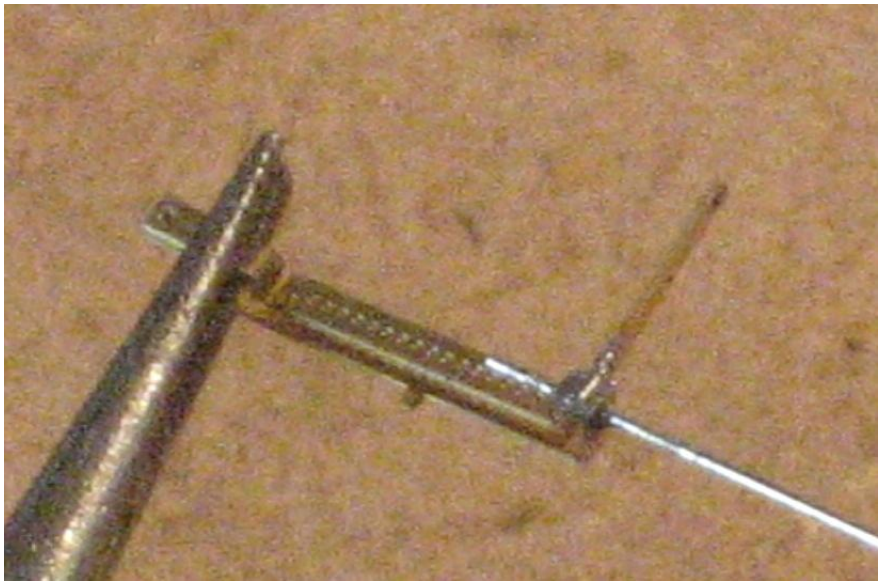


Make sure that the holes in the brake lever guard/bracket/stay (25) can accept 0.31mm wire and remove from the fret.

Separate the lever guard/stay from the lever guard bracket. Firstly fold the stay through 180° with the fold line on the outside whilst you're going along (you will also need to push out the rivet and twist the end of the stay to fit against the axleguard. Solder a length of wire through the holes where the lever guard and stay meet to represent a bolt).



Fold the lever guard along with the lever guard bracket referring to Fig. 5 above.



Solder the lever guard and bracket together using 0.31mm wire to align them. Trim the wire on both the front and back to represent a bolt. The whole assembly can then be located in the solebar and soldered in place. There are slots in the solebar to receive the lever guard brackets.

Axleboxes and springs

Now is a good time to fit the cast axle boxes and springs. It will make life easier when bending up the brake levers as they should be bent, like the prototype, to clear the axleboxes and springs. The back of the axleboxes will of course need slotting to allow the wheel bearings to move with the springs and drop out if making them removable. Some types come with the riveted reinforcing strips for the axlebox guides moulded on. These should be removed if you are using the etched riveted axlebox guide overlay (3).

Brake levers

Firstly make sure that the holes in the following items can accept the correct size of wire then remove from the fret.

Brake levers (26/27) 0.8mm and 0.31mm
Secondary brake lever vee overlay (28) 0.31mm
Lifting links (29) 0.31mm
Lifting link cranks (30) 0.8mm and 0.31mm
Brake lever actuator (31) 0.8mm

Note that there are two types of lifting link cranks (30). The crank goes behind the brake shaft vee and then is bent to align with the brake lever and lifting links. There is a solid crank to be bent up prototypically or one with half etched fold lines to make things easier if required.

A note on brake levers

There are two types of brake lever included for the side without the lifting links. Most had a plain brake lever (26) which had an actuator (31) fitted underneath. Some though had a brake lever with clutch (27) behind it as you would find on the opposite side to a Morton clutch. Check your prototype.

Plain type with actuator

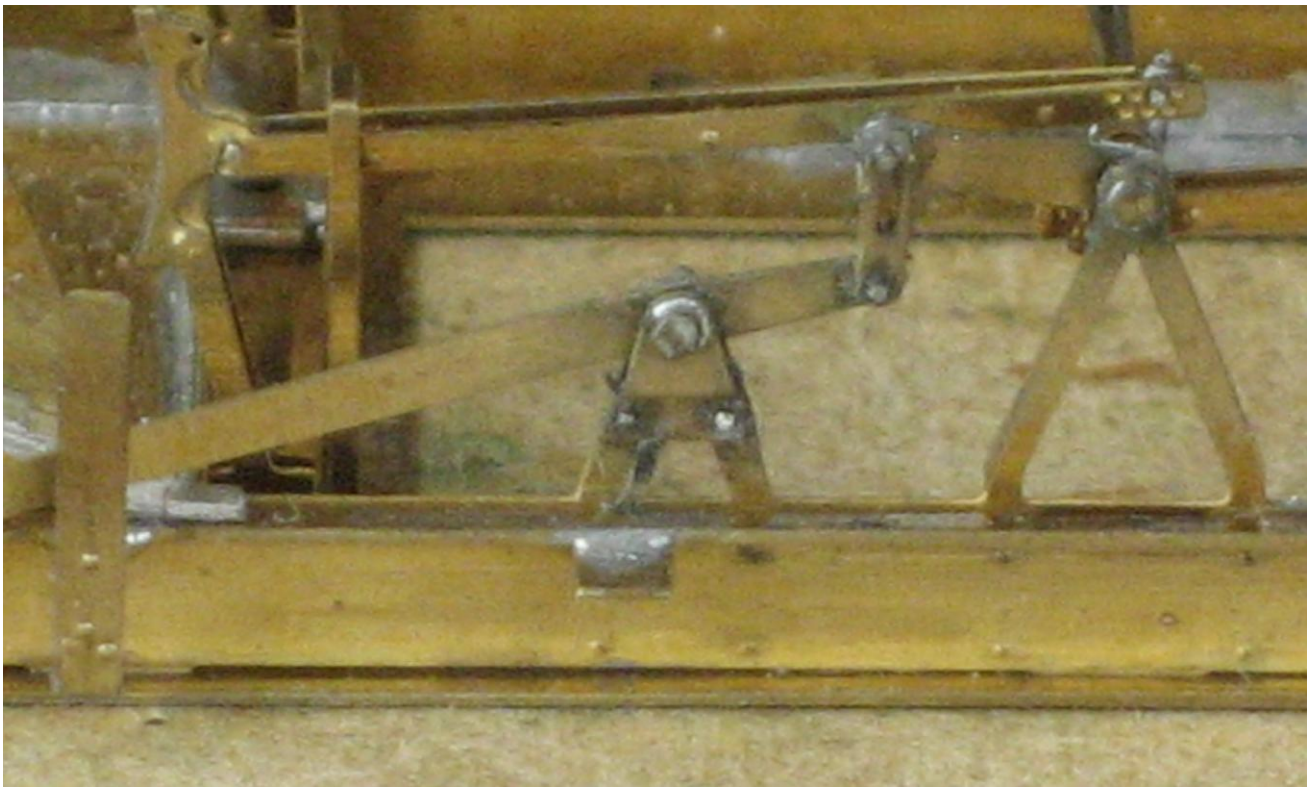
Type with clutch

Lifting link brake lever

A piece of 0.31mm wire needs to be soldered in place so that it projects at least 1mm on both sides at the end of the lifting link brake lever (26). If you are in any doubt this is the lever with two holes in. This will enable you to locate the lifting link in place. The same thing needs to be done with the lifting link crank (30) of your choice. A short length of 0.8mm wire needs to be soldered through the brake lever. The easiest way of doing these pins is to follow a similar method to the pins in the axle guards by drilling holes in a piece of scrap soft wood to accept the appropriate size of wire and then soldering in place.

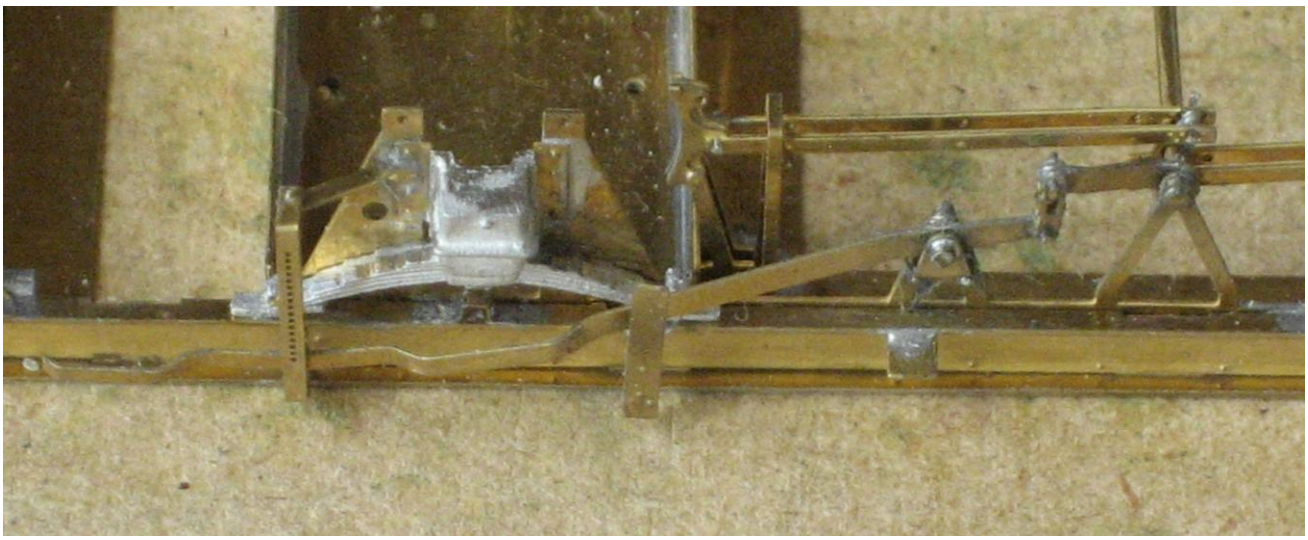
The brake lever needs to be bent up as per the prototype clearing the axleboxes and then cranked for the handle. Check on the model and adjust until you are happy with the shape. Once you are happy with the shape the brake lever can be soldered in place. You will need to fix the secondary brake lever vee overlay (28) in place at the same time. There are 0.31mm holes in it and the vee on the axleguard assembly for short wire pins to aid this.

The lifting link crank can now be bent or folded to shape depending on type. Note that the crank goes behind the vee. Adjust if necessary so that it aligns with the brake lever when placed behind the main brake shaft vee. At this time remove the brake lever actuator from the fret and fold the small tab on it through 90°.



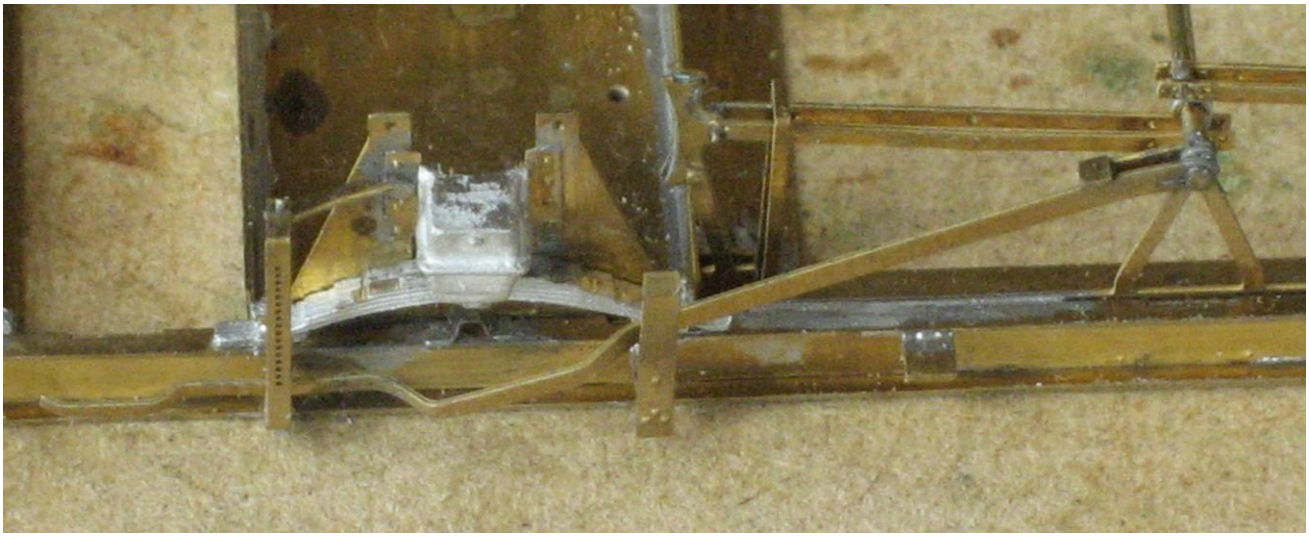
Cut a length of 0.8mm wire to form the brake shaft. This should extend approximately 0.5mm from each of the vees. Locate through the vees with the lifting link crank and brake lever actuator (if required) threaded on to it. Note that the brake lever actuator should be arranged so that the tab faces outwards from the chassis. It will go up against the bottom of the brake lever on that side. Tack solder the brake shaft in place making sure you leave the crank and actuator free.

Next fit the lifting links in place joining up the brake lever and the lifting link crank and solder in place. Note that there should be two lifting links, one on either side of the lever/crank. I find some aluminium soldering clips are handy when doing this as it's a bit of a fiddle.



Non lifting link side brake lever

If you are using the type with a clutch (27) then the end needs folding through 180° with the fold line on the outside to represent the clutch. Which ever type you are using and as with the lifting link brake lever, it needs to be bent up as per the prototype clearing the axleboxes and then cranked for the handle. Check on the model and adjust until you are happy with the shape. Solder in place. If you are using the plain type brake lever then you can then solder the brake lever actuator in place so that the tab is up against the bottom of the brake lever.



Hopper door handles

Fit two lengths of 0.31mm wire on the chassis so that they pass through the hopper door handle brackets on the axleguard/solebar assembly and project approximately 3mm past the each side of the chassis. Carefully solder in place. Remove the hopper door handle bracket overlays (35) from the fret and fix in place using the 0.31mm wire as a locating aid. Make sure the hopper door handles (36) can accept 0.31mm wire and remove from the fret. The handles need to be bent so that they clear the solebars. Locate on the wire and solder in place. An excess in the wire can now be trimmed back.

End Sheeting

The ends of the underframe were covered in metal plate. Chassis end overlays (32) are included to replicate this. There are two types included with the kit, one has the cut out for the vacuum cylinder shaft and others don't. If you are building a vacuum fitted wagon use the one on the VB spares etch. In both cases locate onto the ends of the chassis and solder in place. Note that on the unfitted type there are rectangles which locate into the openings on the chassis to aid alignment. On the vacuum brake version use the four small holes to locate the overlay in place using short lengths of 0.31mm wire.

Steps

There are two types of end step (38) included. There didn't seem to be much of a pattern to which type was fitted so check your prototype.

Fabricated

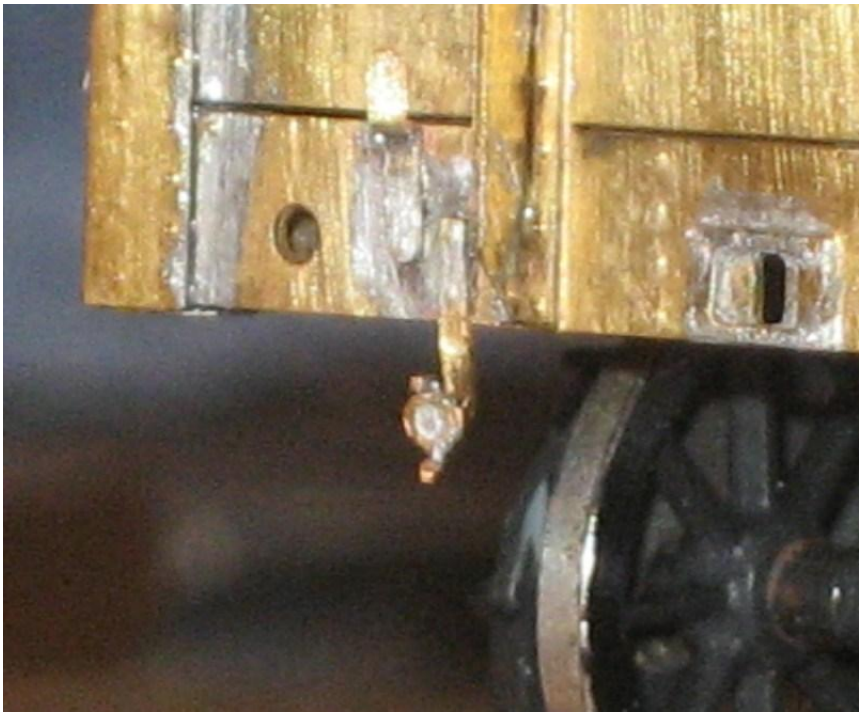
Plain

In both cases press out the half etched rivets that represent the bolts used to attach the steps to the solebar. The plain type basically folds into a channel shape. The fabricated type is a bit more delicate. You need to fold the sides up whilst firmly holding the centre of the part. The top and the step can then be folded up. Reinforce the fold lines with solder. I couldn't manage to find a way of capturing the prototypical bend in the step so left mine flat.

Locate on the left hand end of the chassis and solder in place.

BR swan neck vacuum pipe brackets

BR swan neck vacuum pipe brackets (39) can be found on the VB spares etch. These are quite distinctive and come in two parts. There is a bracket which attaches to the solebar and a round head that has ‘tails’ that fold up. Press out the rivets on the bracket and remove from the fret. Twist the base of the bracket through 90° so that the interface with the head faces away from the rivets. This bracket can then be soldered to the back of the head (the side with no half etched areas). It is easiest to do this while the head is still attached to the fret. There is a small slot to help provide a positive location. Once soldered in place the assembly can be removed from the fret and the ‘tails’ on the head folded out. If you’re brave these fold lines can be reinforced by the use of a very small quantity of solder and a very quick soldering iron. Some step soldering might be a good idea but I haven’t encountered many issues with just using 145° solder. These can then be soldered in place on the headstock.



Handrails

These varied so check your prototype. Most unfitted hoppers seem to have a handrail at both ends on top of the chassis; vacuum braked ones at the opposite end from the vacuum cylinder. You will need to use the locating holes provided to drill through the chassis end overlays, form the wire to fit into these holes and then solder them in place. The locating holes are marked in green on Fig. 6 and the picture below that shows what they look like. The horizontal part of the handrail should be around 1mm above the end of the chassis.

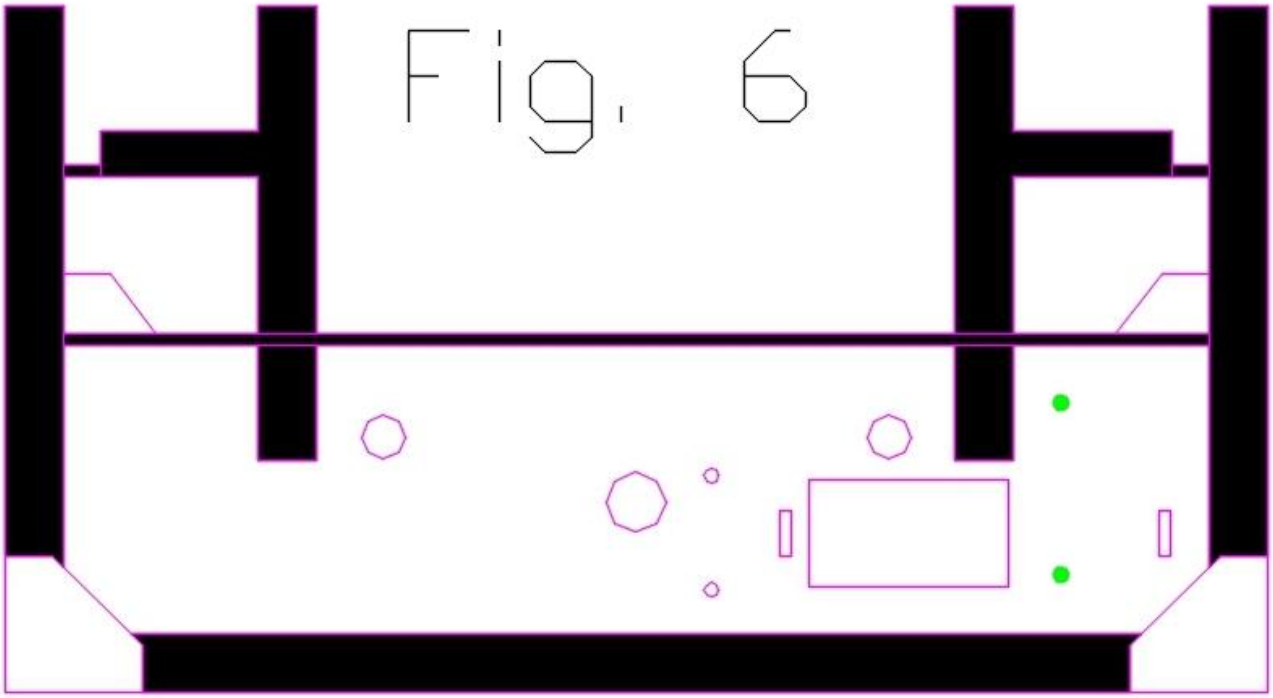


Fig. 6

The arrangement of the handrails on the ends of 21T hoppers varied considerably. I have included some handrail brackets (37) to replicate the type seen below. Use 0.31mm wire for the handrail and glue the brackets in place on the hopper ends.

Vacuum cylinder bracket

Vacuum cylinder brackets can be found on the VB spares etch. The eagle eyed amongst you will notice that there are some on the main etch. For some inexplicable reason I failed to spot on the test build that due to their size the inside of the brackets are 1mm too close to each other meaning that there isn't enough space for a 21" vacuum cylinder, hence the replacements.

Make sure that the hole on the inner bracket (33) can take 0.5mm wire remove from the fret and fold into a channel shape. Make sure that the small holes in the outer bracket (34) can accept 0.31mm wire and the larger hole 0.5mm wire then remove from the fret. There are two slots on the outer bracket and the triangular 'wings' on the inner bracket pass through these slots. Once in place the outer bracket then folds into an L shape so that it looks like the bracket in the picture below. Solder together.

Use short lengths of 0.31mm wire to locate the brackets onto the running plate. Note that if you are using a cylinder as per the prototype and pivoting it on the brackets you will need to locate the cylinder in place before the second bracket. In other words once they are both fixed to the chassis there's no chance of prising the brackets apart to fit the cylinder in place.

Lamp Irons

Lamp irons (40) are included on the VB spares etch.

The vacuum braked 21T hoppers were not XP rated when built and were therefore not fitted with lamp irons. Later on they had them fitted. I would imagine that this took place when the ban on guards riding in the rear cab of diesel locos on fully fitted trains was lifted around 1968. As always check your prototype.

Press out the rivets whilst still in the fret and then remove, fold up and fix in place on the headstock.

Painting

One of the advantages of having the chassis as a complete unit with solebars and headstocks is that you can paint it separately from the body and then glue the two together afterwards. If using an airbrush or aerosol this means you can prime it and then paint it black with no masking at all which makes life a little easier.

I now use Halfords grey primer in a tin through an airbrush with cellulose thinners to prime just about everything, including plastic bodies. The primer is synthetic and has no adverse effects on the types of plastics used on RTR railway models and kits. The cellulose thinners used evaporate so quickly that they don't have time to attack the plastic. You can then put your choice of paint over the top including cellulose. Don't use the red oxide in a tin on plastic though as it won't adhere and the paint will just come off.

Notes on wagon bodies and weighting

The suspension on the underframe is designed to work optimally under a 50g load. There is simply not enough room to fit sufficient ballast in the underframe so the only place for it to go is in the bottom of the hopper. Liquid lead isn't a bad idea. It can be painted to match the body colour and shouldn't be too noticeable. Full hoppers are no problem as this can be disguised below the load.

Finally

Thanks must go to Tony Comber and the Dean Forest Railway along with the staff of The Buckinghamshire Railway Centre at Quainton for letting me measure up some of the wagons in their care which have greatly helped in the preparation of these kits.

Last but certainly not least if you haven't come across the wonderful resource for BR wagon photos that is Paul Bartlett's website then I would thoroughly recommend a visit to:
http://paulbartlett.zenfolio.com/

Justin Newitt 2015

Suppliers List

Eileen's Emporium (wire and sundries)
Unit 19.12 Highnam Business Centre
Newent Road
Gloucester
GL2 8DN
UK
www.eileensemporium.com

Lanarkshire Models and Supplies (buffers)
9 Nairn Avenue
Blantyre
G72 9NF
www.lanarkshiremodels.com

C&L Finescale (Exactoscale wheels, bearings and couplings)
Aran Lodge
Severn Road
Hallen
Bristol
BS10 7RZ
http://www.finescale.org.uk

Masokits (coupling hooks)
Michael Clark
c/o 27 Crotch Crescent
New Marston
Oxford
OX3 0JL
www.scalefour.org/masokits

MJT (axleboxes, spring castings and sprung buffer heads)
Dart Castings
17 Hurst Close
Staplehurst
Tonbridge
Kent
TN12 0BX
www.dartcastings.co.uk

Wizard Models (axleboxes, spring castings and buffer heads)
PO Box 70
Barton upon Humber
DN18 5XY
www.wizardmodels.co.uk