

SCRATCH-BUILT: FFESTINIOG COACHES

BY

Bill Allen

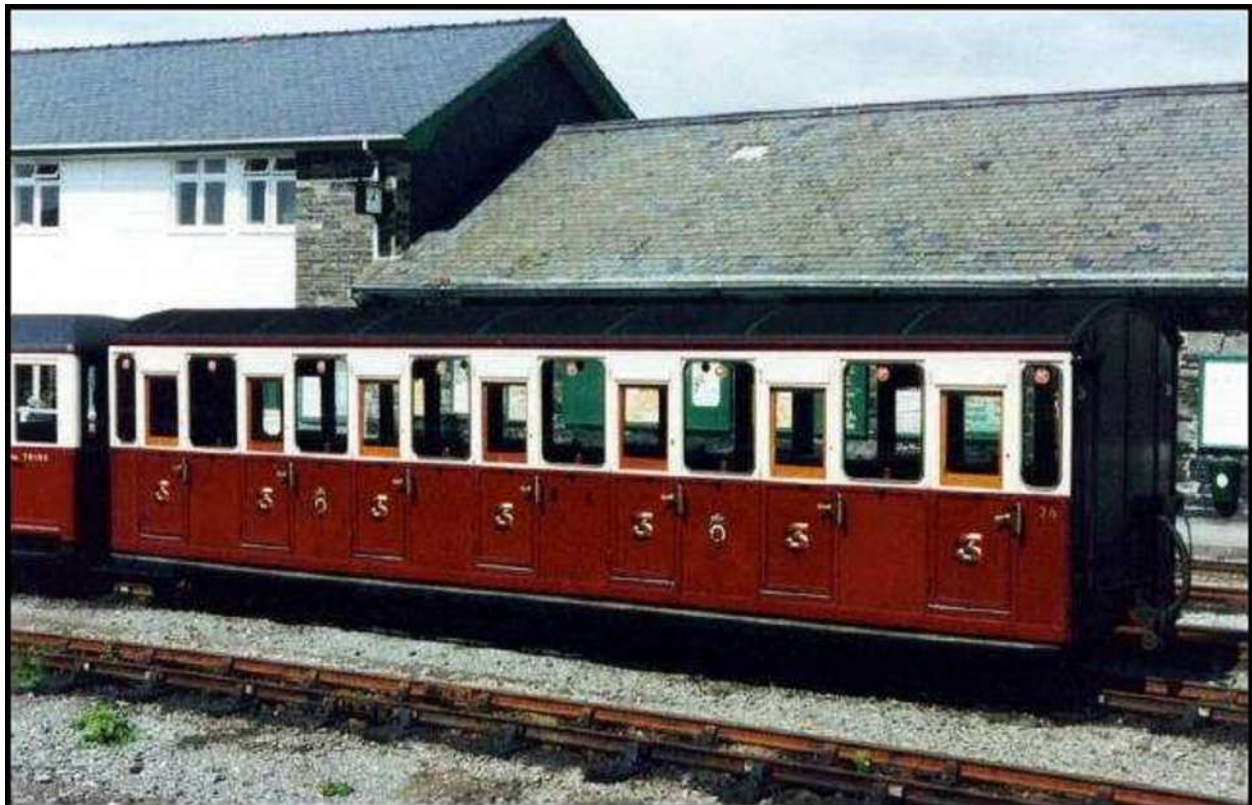
Woodside CA. USA

[\(Live Steam Forum/Topic: Ffestiniog Coaches\)](#)

[\(Live Steam Forum/Topic: Double Fairlie Completed\)](#)



The Model



The Prototype

I just completed the two 14-door coaches to go with my Double Fairlie consist. Next will be two Bug Boxes.

I started the documentation of the coach build back in my Double Fairlie thread but it is getting too big so I am starting a new one. After advise from you all, I decided to make them out of wood rather than brass.

Terry "tac" Foley, UK

"Somehow, that has to be got over here for the 16mm Association show in April - it will be a certain show-stopper." [i.e. The Double Fairlie]

"Beautiful work!"

"I'm lucky, I can go see the real thing anytime I want to, but to see one over on your side of the pond is a real privilege and tribute to your skills."

"We really DO need some video - please."

"Do you intend to build any cars for it - if so, may I recommend the IP Engineering versions."

Tac: Thanks for the compliment. I am planning on making some passenger cars.

I looked at the IT site and they do have nice stuff and reasonably priced but I am compelled to scratch build them using metal (Brass mostly) with mahogany trim (window frames and door trim) I was able to get some photos off the web that show the body construction but the chassis detail is always hidden. I noticed on the IT models the bogies were clear at the end of the car. Is this the way the original is/was?

If you or anyone else has photos or dimensions of the original cars you can post or send links to, I would appreciate it. I'll try to get a video out next week.

Terry "tac" Foley, UK

"Sir - I have just e-mole the FR and Roger Dimmick with the query. As for the positions of the trucks vis-a-vis the underframes, that is quite correct, as a quick squint at the site photos of their passenger stock would reveal."

<http://www.ffestiniograilway.co.uk/...riages.htm>

"There might be something here that would help - "

<http://roger-dimmick.fotopic.net/se...vanced.php>

"Next time I'm over there I'll try and get some better pics for you, but it won't be until March. Please PM me if this is ok by you. Whinemeal, I'm doing some research in my dozen or so books on the FR, so watch this page."

"PS - of course, I MEANT to write IP [Ivan Prior] Engineering, as Mr. Bunce points out in the next post. You had a look anyhow, it seems."

Peter Bunce, UK

"Nice model you have done well -congratulations. You ask about passenger cars."

"There are some kits made by IP engineering (<http://www.ipengineering.co.uk/>) for Festiniog coaches - these are laser cut in wood not metal, that may help you."

"Generally what is called a 'Bug box' or a 4 wheel coach is at the front of the trains they have better couplings for the Fairlie than the bogie coaches."

"Also have a look at the following photo site for many views of the coaches <http://roger-dimmick.fotopic.net/> "

"Also have a look at an 'official' FR site at [RHEILFFORDD FFESINIOGG RAILWAY SOCIETY - CAR SHED](http://www.rheilffordd-ffesiniogg-railway-society.co.uk/). The later stock is at the bottom of the photos - this is 'the barns' design."

Thanks to all for the passenger car info. The Roger Dimmick photos were very informative. From the restoration photos it looks like they had wood frames and wood or plywood sides with a thin metal skin on the outside. This will be very helpful in the design as I want to be as prototypical as possible

Peter Bunce, UK

"Not sure about the covering of metal though I am quite prepared to be proved wrong!"

"'Traditional' coach building was/is in wood with overlays on the joints of battens these add up to be called paneling. No metal except in the underframe and the handles/stiffening rods (which were from the back of the down the center seats to the roof - 2 of them) - yes you had to climb over the back to get to the other side! Have a look at the photo of the 1st class one to see one of the vertical rods.

Have a look at the open "bugbox" being built on the Festiniog pages."

Here... <http://www.ffestiniograilway.org.uk/images/stories/mar10/20100325-portholebugbox.jpg>

... and here.

<http://www.ffestiniograilway.org.uk/images/stories/aug10/Wk4/20100822-bugbox.jpg>

"Both of the same vehicle, and totally traditional as they are 'Heritage' vehicles and are being rebuilt to the standard when they were built - in 1864 see the Wiki entry at...

http://www.festipedia.org.uk/wiki/Bug_Boxes

... and go to 'Carriages pre preservation' for more."

http://www.ffestiniograilway.org.uk/index.php?option=com_content&view=article&id=294:latest-pictures&catid=45:galleries&Itemid=122

"All this is of the original coaches, which include some bogie vehicle to have been rebuilt to their 'as delivered' condition (& they are kept in covered accommodations to preserve them) the modern coaches will however follow the traditional designs but are built much longer, and with better accommodation. The Heritage stock is generally small as befitted the clientele at the time. The first modern stock is generally called 'the barns'."

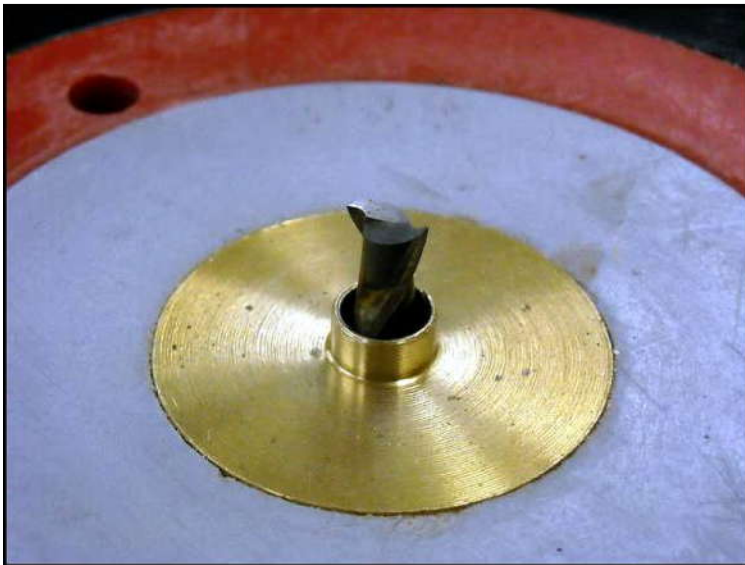
Tony Willmore, Rhos Helyg Locomotive Works

It is commercially available aluminium-faced plywood, that is plywood with an aluminium sheet bonded to it and all cut as one sheet.

Yes Tony, that is exactly what it looks like. In the picture I saw the aluminum sheeting was partially peeled off. Thanks

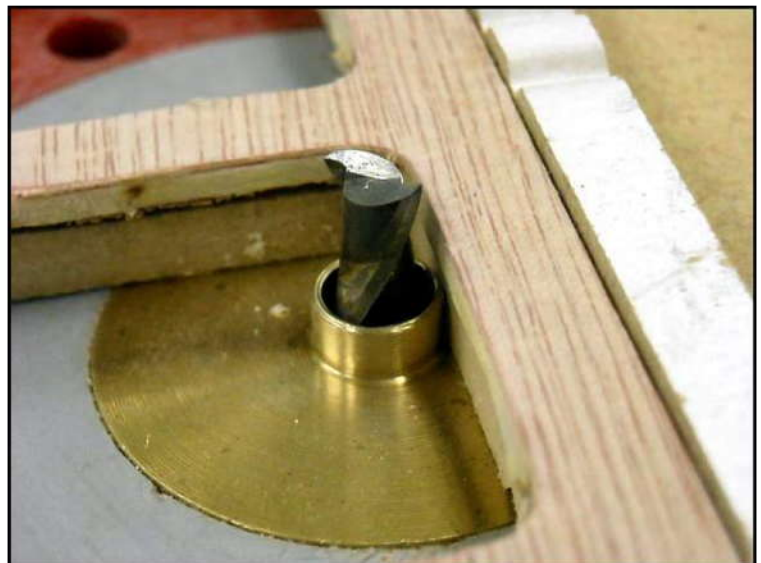
Ok, I started on the Ffestiniog passenger cars this weekend and took a few shots of my progress. I need to send this and go back and edit it to attach the photos, which I will do, so check back in an hour or so.

In the picture to the right at the top is the jig I made out of some old bead board I had lying around. I did the cutouts with the jigsaw. The white strips are to hold the work piece tightly in place while cutting out the holes. The lower pieces are the car sides with an outside and inside. They will be sandwiched together with the glazing in between. The material is 1/16" Luan plywood from Home Depot (yes I am that cheap).



To the left is the pattern making setup in the router with a solid carbide bit and bushing.

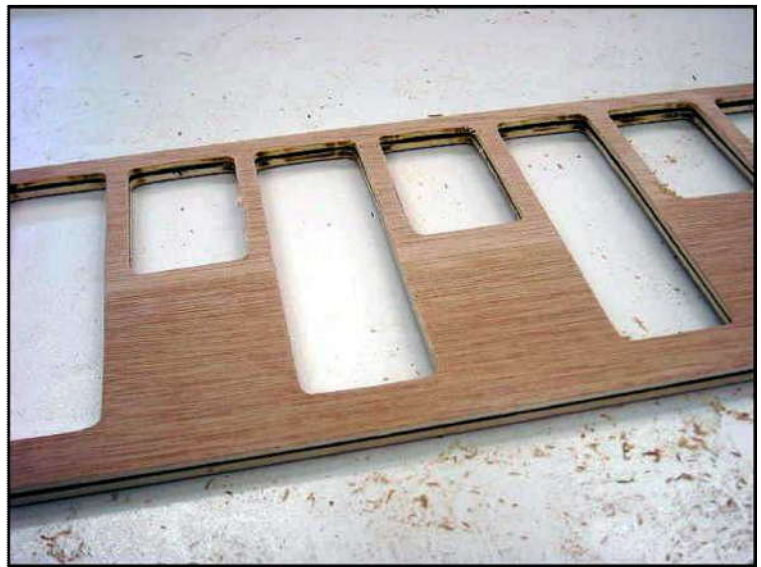
Using this setup gives me sides, which are exactly equal to each other, and allows me to sandwich the glazing between two sides. As you can see, there is a .020" difference between the jig and side cutout. This was accounted for when the jig was made.





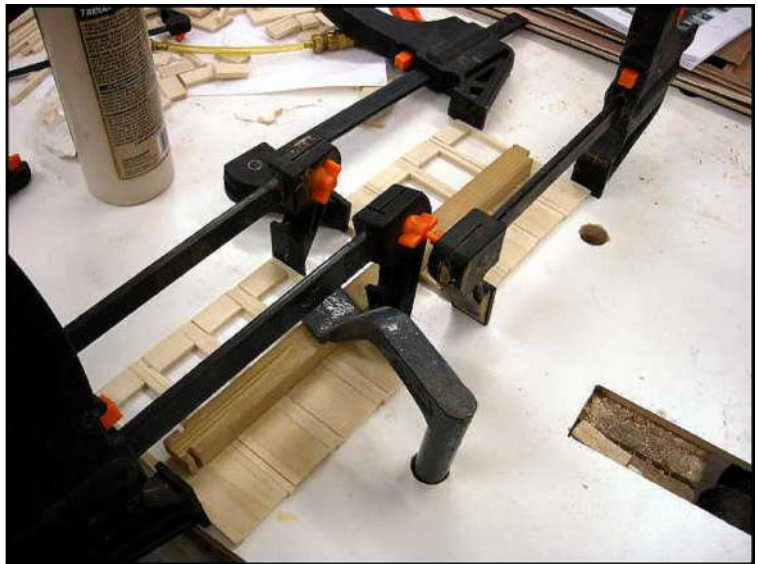
The first of eight sides comes off the router table. The rest will go real fast now.

On the left can be seen a pair of inside and outside pieces. Four sides were cut from each side so they fit back to back with the rough side in the middle. The outside will get paint while the inside will be stained mahogany.



Pieces are cut for the 28 doors on the two cars. Note the photo of the prototype on the table.

Door glue up is eight at a time. The wood strip in the middle is to keep the thin pieces from buckling up under the clamp pressure.



Doors are fitted to the openings as the rounded corners are squared up with a file. I forgot to show how the louvers at the top of the door were formed but it was easy. Mount one blade from a stacked dado set or a saw blade if you don't have a dado set (the saw blade doesn't leave a perfectly square groove) in a table saw and set it at 15 degrees. Raise it so the low side is even with the table and run a 1/8 X 1/2" strip through while increasing the rip fence distance 1i/8" at a time. Then cut to length.

One completed coach side.





Door handles turned on the lathe. Ends were rounded over on the grinder

This is the jig I made to bend the grab handles.



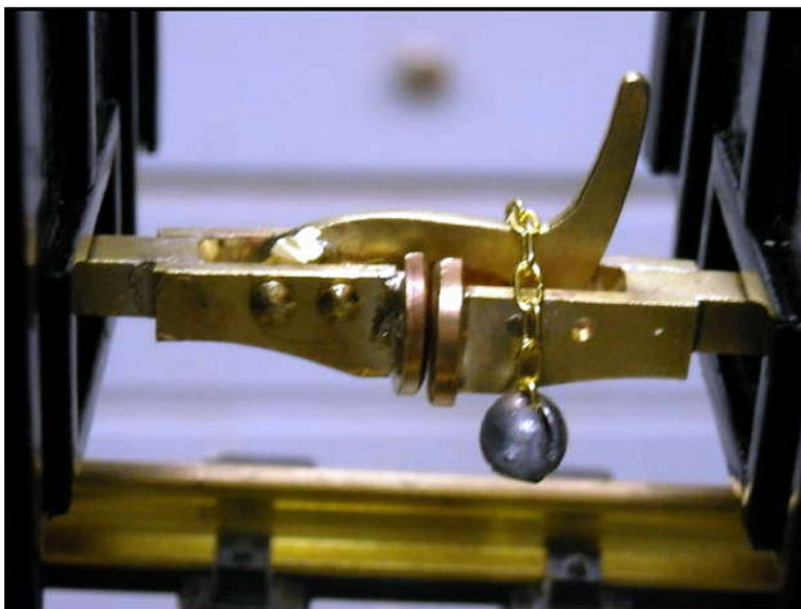
The wheels are some old Bachman ones I had laying around. I turned the flanges down on the lathe. The sides are 1/8" bar stock and the top 1/16".

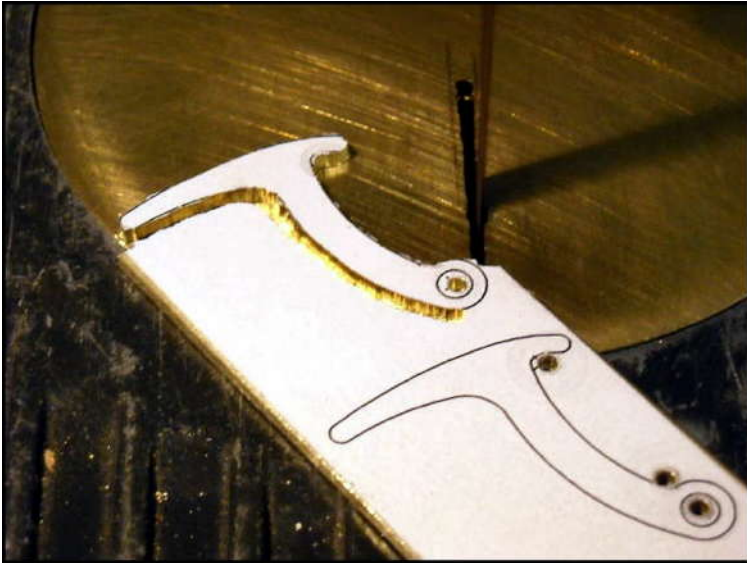
This is a resin casting I made from some Bachman trucks.



Here is the best picture I could come up with of Chopper couplers. Note the ball and chain to keep it hooked up.

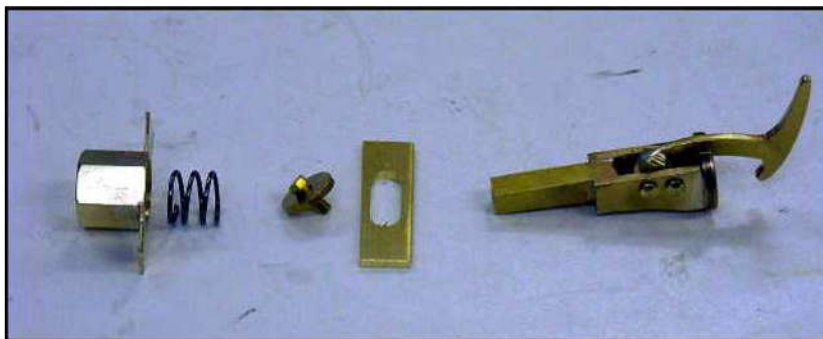
Here is my copy.





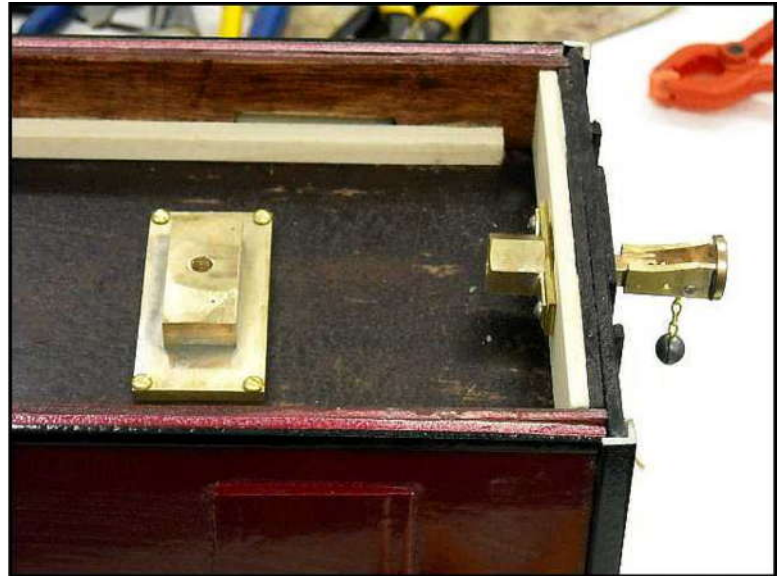
The choppers are cut with a band saw

The buffer ends were turned and cut on the lathe then milled. The sides were cut from 1/16" on the band saw. The shaft is 3/16" square stock.



Here is the setup. The spring keeps the coupler centered and provides a buffer action. The slot allows horizontal movement and keeps the coupler from twisting.

The coupler is mounted and the truck mount is in place. The truck is mounted with a shoulder bolt and spring



Two coach set.

Andre Anderson, Portland Oregon

"The coaches look gorgeous, the color is perfect and I just love them. Just a quick question, I thought that there would have been two chopper arms, what happens when a car gets turned around and you have blank plates with out chopper arms next to each other> Or is this a case where the cars never get turned around?"

Andre: That is a good question and I thought about it myself. As you can see from the prototype, there is only one chopper lever. The other photos I saw also had only one. I assume if a car gets turned around they remove the pin for the lever and put the lever on the other end.

This question would probably be better answered by one of our friends across the pond.

Helicon Steamer

"Typically, the Welsh lines didn't turn their locos or coaches. On the Ffestiniog, the really isn't a facility for turning coaches other than Bug Boxes. I believe that those could be turned on the wagon turntable, but certainly not the bogie coaches. The Fairlies are double ended except for Taliesin, which faces Blaneau Ffestiniog. Some of the George England locos ran facing downhill about 1900, but in recent times, they have run facing uphill. It seems that keeping the crown sheet covered is a bit important."

Henner Meinhold

"Bill, the coaches turned out really nice. I think, the couplers are asymmetric, as neither FR nor WHR seem to have a wye, at least for normal operation. Did you use a form tool for the door handles? One of these days we have to talk you into building freight cars. A mixed train with some slate wagons would look great!"

Henner: I learned this skill from Dennis and it is really quite easy.



The above picture shows two form tools (bottom center) I made. They are made from 5/16" lathe tool stock.

I mount a Dremel tool in a vise with a cutting wheel on it. The angle for the flange is done on the grinding wheel and the radius is cut with the cutting wheel.

The large turning (on the left) is cut from 3/16" stock and is drilled out for 3/32" rod. I use this for grab handles on the locos the thread is #2-56.

The smaller one (on the right) is cut from 1/8" stock and is drilled out for 1/16 rod. The lowest piece is the stock from the lathe. The next one up is for 1:16 grab handles with a #0-80 thread and the top one is a door handle.

The door handle is done by grinding the nub off the top and a slight flat on the side to accommodate the drilling process. It is then mounted in the mill vise and the hole for the handle is drilled. The handle is set with epoxy. This one was a reject because the handle was not perpendicular

David Leech, Delta, Canada

"A great piece of coach-building. I'll look forward to seeing them in Sacramento, assuming that you are going to be there!"

"If I may point out one error (I only 'think' it is one, as I am not a Festiniog aficionado, although I WAS a member of their preservation society in the late 50's). Anyway, most of the railways that I have come across used 'T' door handles, pivoted in the centre, and not ones with 'one arm' as you have made. Mind you, perhaps they would be too hard to make. Guards vans did however use one arm types. Even earlier handles were with round handles to turn."

Thanks David, I will be in Sacramento. See you there. It is hard to do these just from photos from the web. Maybe I'll try some T handles on the bug boxes

Jason Kovac, Lakewood, NJ

Very nice coaches. What blade are you using on the brass?? I usually end up cutting the brass with a piece of wood underneath it keeps it from grabbing.

Jason: This is just a 1/4" low-tension wood cutting blade (high quality). It is 8 TPI which is multi use for wood but a little coarse for brass. I will probably get a 12 TPI or finer next time. I have a metal cutting blade that I use for big projects but because of the set in the wood blades, it is easier to make sharp turns as you can almost go sideways with it.

This is a Jet 16" wood band saw. If you look at the throat plate you can see that it is one I cut out of 1/8" brass. It is virtually zero clearance. This keeps it from grabbing and also allows cutting of very small parts which would fall through a regular band saw.

Speaking Of grabbing, I have never had a problem with the band saw but when I tried to cut some window openings out on a loco cab on the scroll saw, I found it impossible to keep the thin brass from jumping up and down. I then made a jig out of Masonite similar to the one in this thread and mounted an end mill in the router table with the same pattern making setup. This cut like butter and a few minutes with the corner file and I had perfect cutouts, which were all the same size.