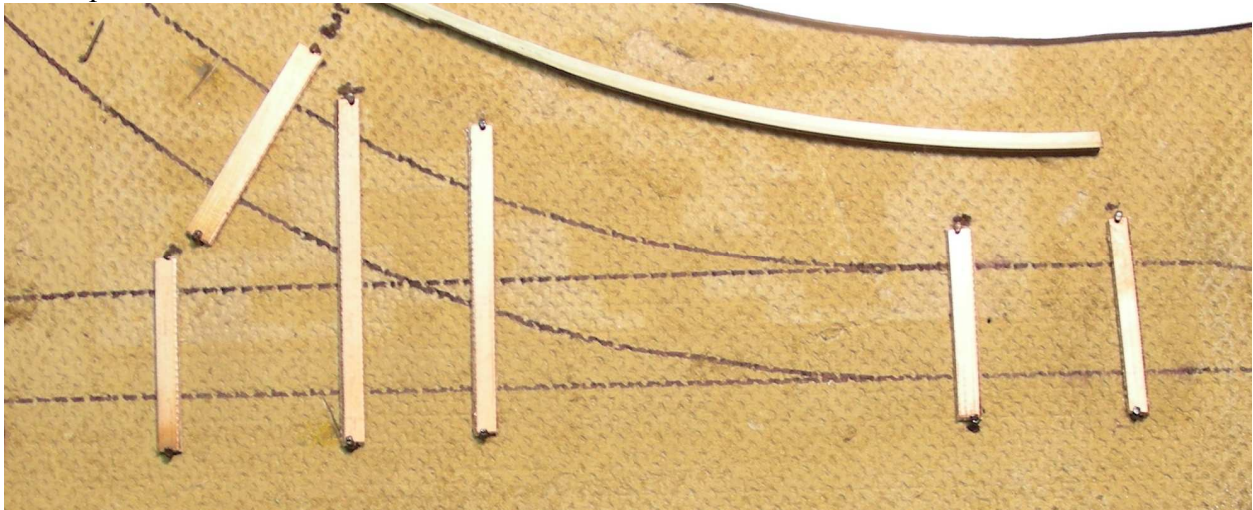


## Building HO Trolley Turnouts.

This tip shows how I build HO turnouts using Orr girder rail available from Custom Traxx. Custom Traxx also sells turnouts to go with girder rail that I use when their six inch radius fits my needs. Custom turnouts are needed for larger (or smaller) radii. Single sided PC board ties are used to hold everything in alignment, the rail is soldered to the ties. These ties may be available (Check the East Penn dealer list) or you can make your own from a sheet of PC Board and a metal shear. I build my turnouts at the workbench, then mount them on the layout. I doubt that these turnouts could be constructed in-place.

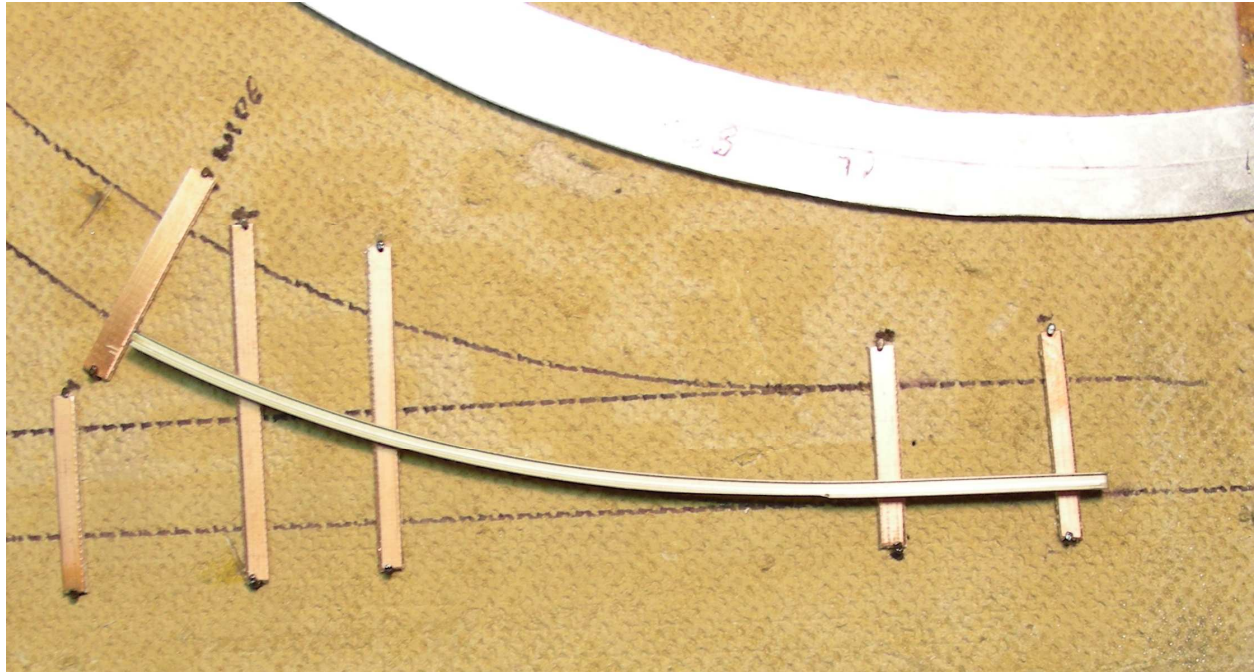
Start by curving the rails using an Orr curving tool. Be sure to use the correct set of wheels for the inside and outside curve.

On a suitable work surface (I use a piece of Homosote) draw the location of rails and spike some ties in place.



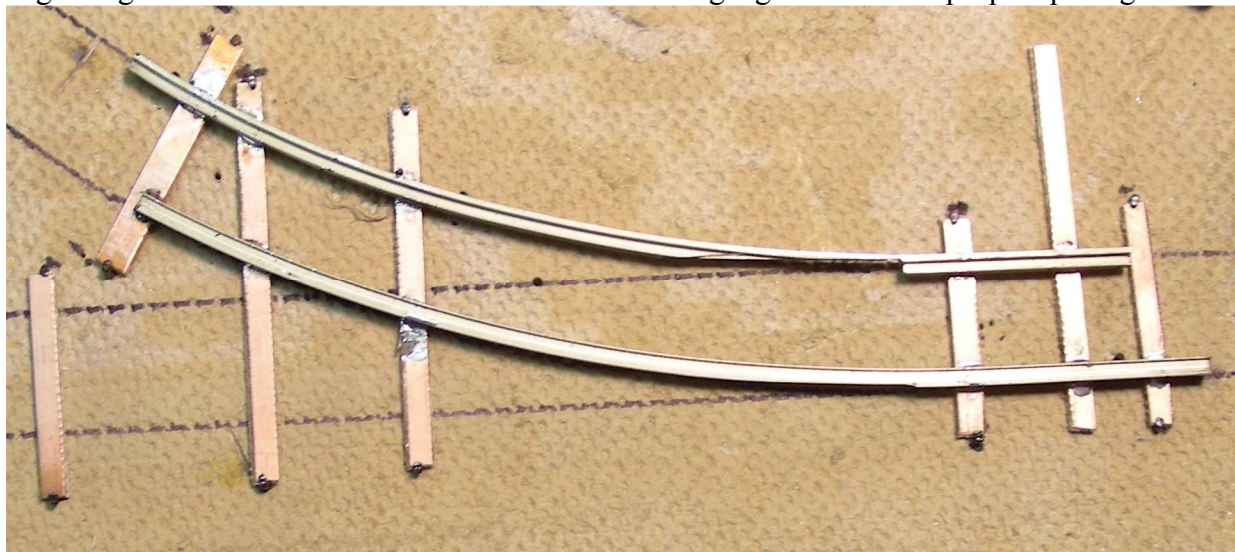
A few more ties than this may be an improvement but be sure to leave the area of the point clear.

I prefer to lay the curved rail all the way through the turnout, then place the straight rails against them to make frog and the “mate”, making it easier to cut the flange way at these points. Therefore the curved rail must be the start of the curve with a straight section beyond the point. Solder the outside curved rail to the ties.

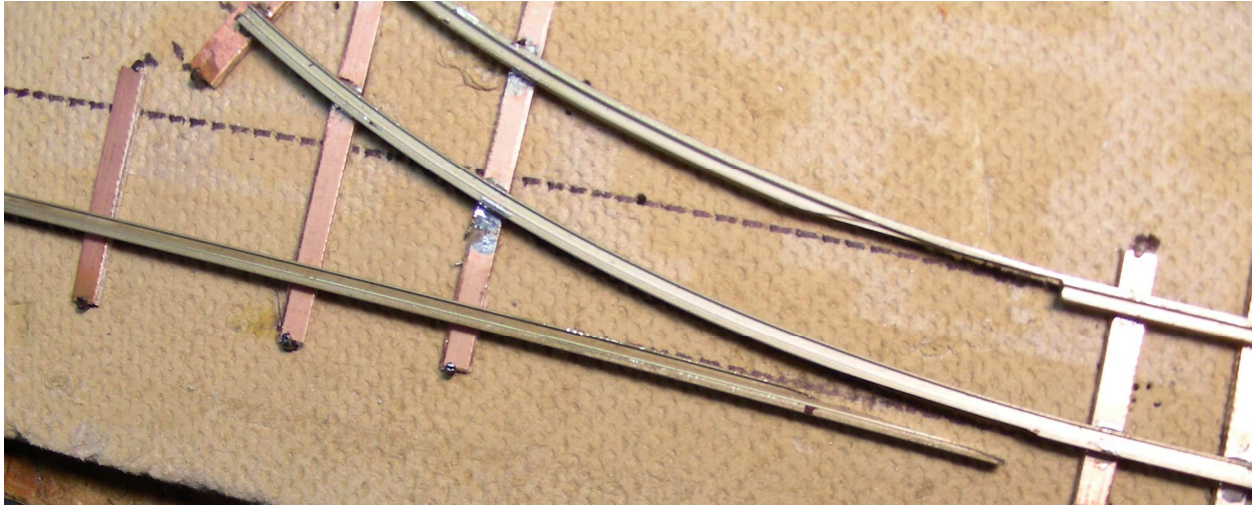


I made myself a radius tool from aluminum as shown above. This is useful in getting the correct radius on the rail.

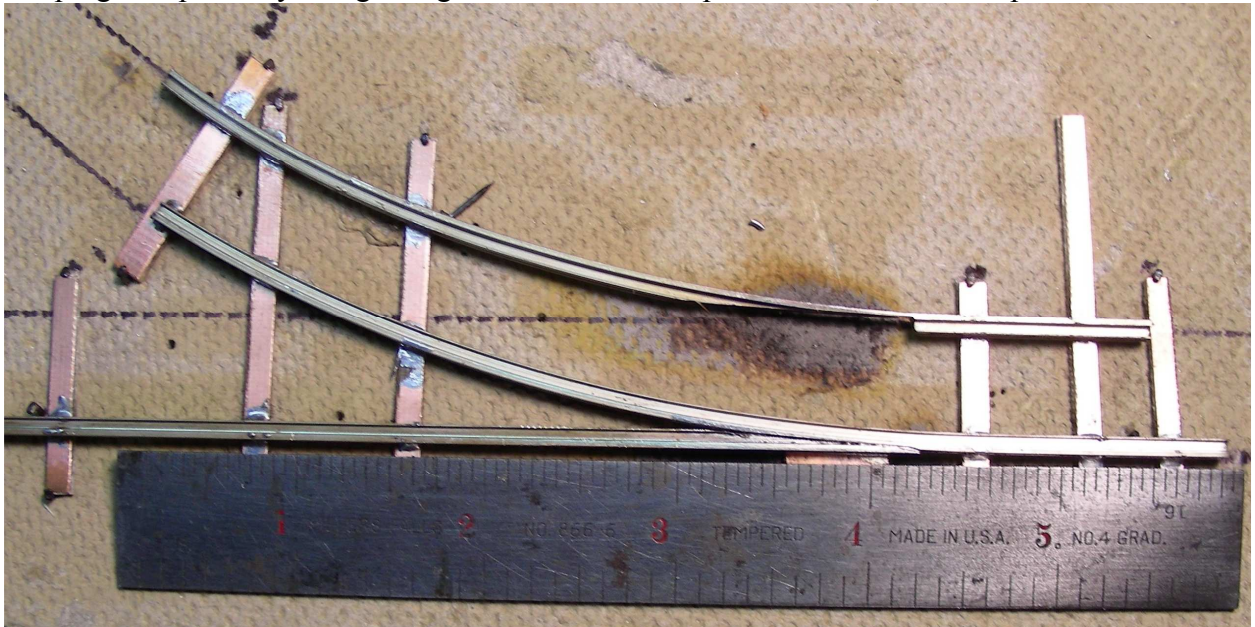
Notch the inside curved rail where the points will be located. I use a disk sander to remove the flange-way down to the edge of the rail head. More metal will be removed later to notch the rail head allowing room for the point. Solder the inside rail to the ties so the notch is opposite the beginning of the curve on the outside rail. Use a track gauge to maintain proper spacing.



Attach the straight rail to the outside curve. File a straight section to a point and shape it to fit the beginning of the curve as close as possible.



Keeping it in perfectly straight alignment with the rail past the Mate, solder in place.

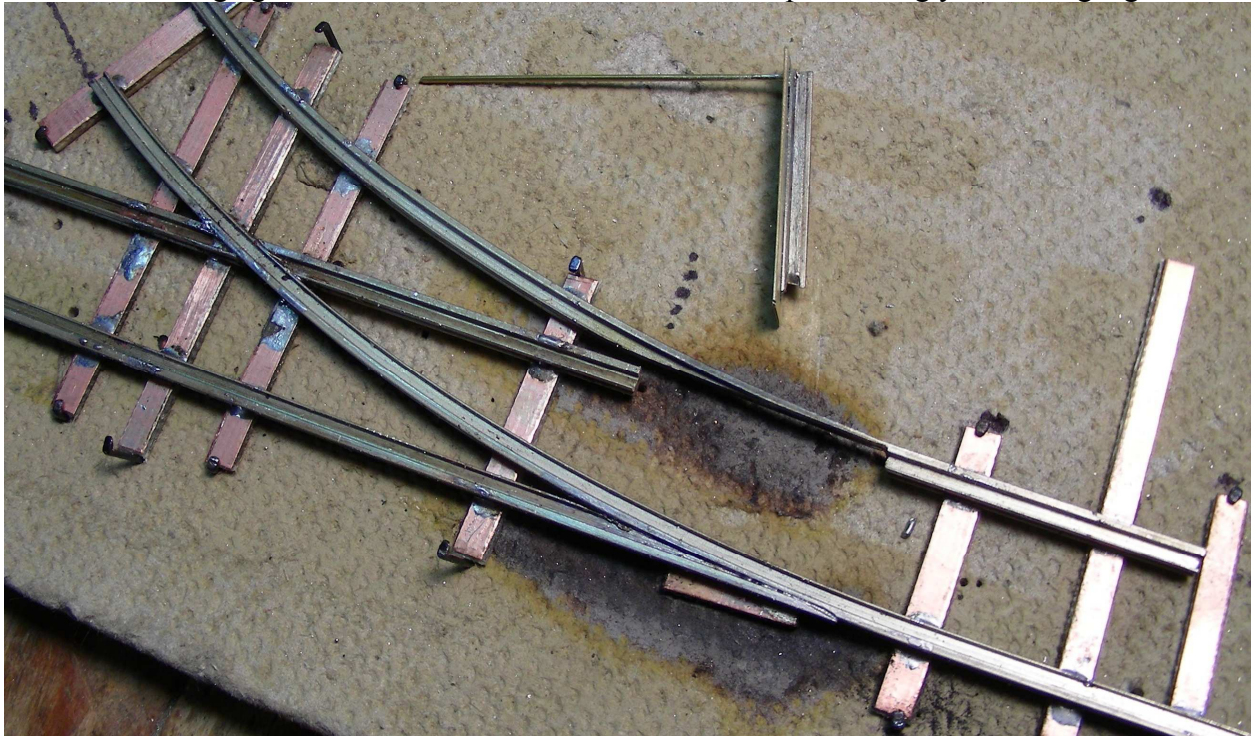


I start by soldering this rail to the ties at the left while keeping it in position against the curved rail. Then I can remove the alignment tool (ruler) and solder it to the curved rail. Notice that I place a piece of PC board directly under the joint for rigidity.

Cut the second straight rail to match the curved rail where it crosses, only one cut should be needed.



File these to snug against the inside curved rail and solder in place using your track gauge.



You now have all the rail in place. The next step is to cut through the railhead to get a flangeway for the straight track at the mate and frog. The main reason I start with the curved track is to make this cut easier. I find it much harder cutting and filing a curved flangeway than a straight one. That doesn't mean this is a simple task, especially on the mate. You'll need to find a way to keep your cutting tools from wandering all over the railhead. I cheat and use a miniature table

saw from Micro-Mark on the mate. The frog is easier because of the angle; I make two cuts with a razor saw at the outside edges, then file away the metal between these cuts.

A section of rail filed to a point and several pieces of brass will complete the turnout. I use a one inch piece of code 100 T rail for the point, filing away one side to a point. The length will vary depending on the radius of the turnout. This point is soldered to a piece of .015 brass that is a little longer than the point and about 1/4" wide. Get a good solder joint here and clean off all excess solder. This brass piece will ride on top of another brass plate and slide under the rails, so it must be flat and free of burrs and solder. I polish the bottom of my plates with 800 grit sandpaper. Drill a #68 or 67 hole through the brass and point at the wide end. I find it best to start with a #76 bit and work up to the larger size. Go all the way through the railhead if possible. A .032" brass wire gets soldered into this hole – again clean off all excess solder and polish the bottom of the brass plate.

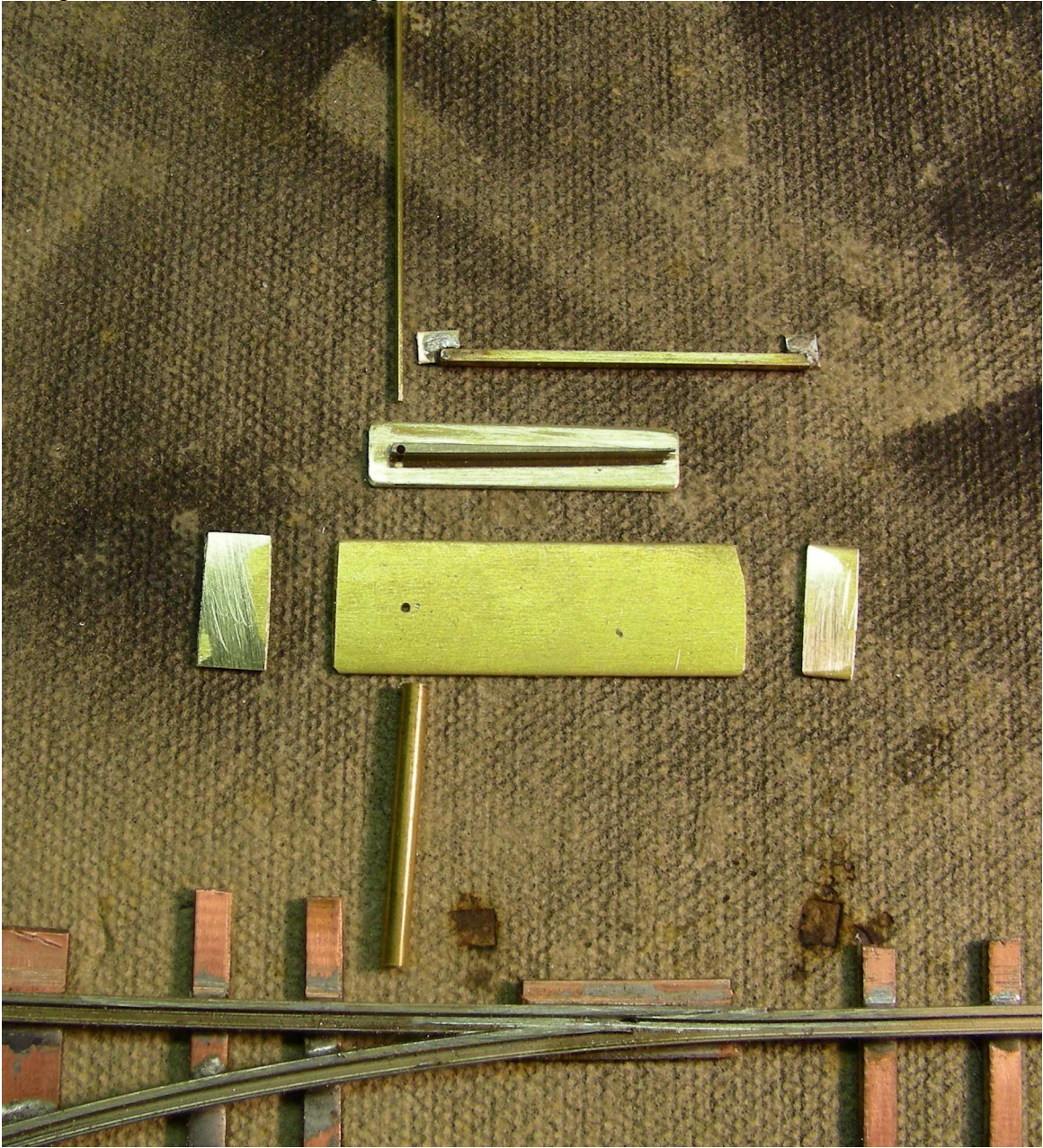
A heavier piece of brass, I use .025", makes the base for this assembly to ride on. As you can see on the picture below this is wider and longer than the point assembly. Drill a #67 or 68 hole for the brass wire and smooth and polish the top of this piece. The wire soldered to the point must rotate freely in the hole while the base of the point lies flat on this piece. To the bottom of this base solder a 1" piece of 1/8 tubing around the hole. The tubing will prevent the point from having a tendency to flop over and bind while it is pulled from side to side with a switch machine or spring.

Two short pieces of .025" brass, soldered to the bottom of the rails, will hold the base in place. Measure these pieces carefully so they don't interfere with the movement of the point. Once soldered to the rail they must be filed down to make them thinner than .025", the thickness of these pieces determine the amount of vertical play in the point which should be held to a minimum. File and test until the clearance is minimum but the points still move freely. I would use .020 for these pieces but K&S doesn't make this size.

At this point check the gauge of the straight track with the point in place. File the notched-out part of the inside rail until the point fits tightly against it and it is in gauge. You should end up with a slight notch in the railhead for the point. When all is in alignment put the point into the base and solder it to the mounting pieces. I just tack solder this so it can be easily removed if necessary, and to keep from unsoldering other joints.

The last piece to attach is a guard to keep the point from opening too far. I use a 1/16" angle mounted on a couple of .015" pads. The pads keep the angle at the correct height; they in turn are tack soldered to the point base mounting pieces.

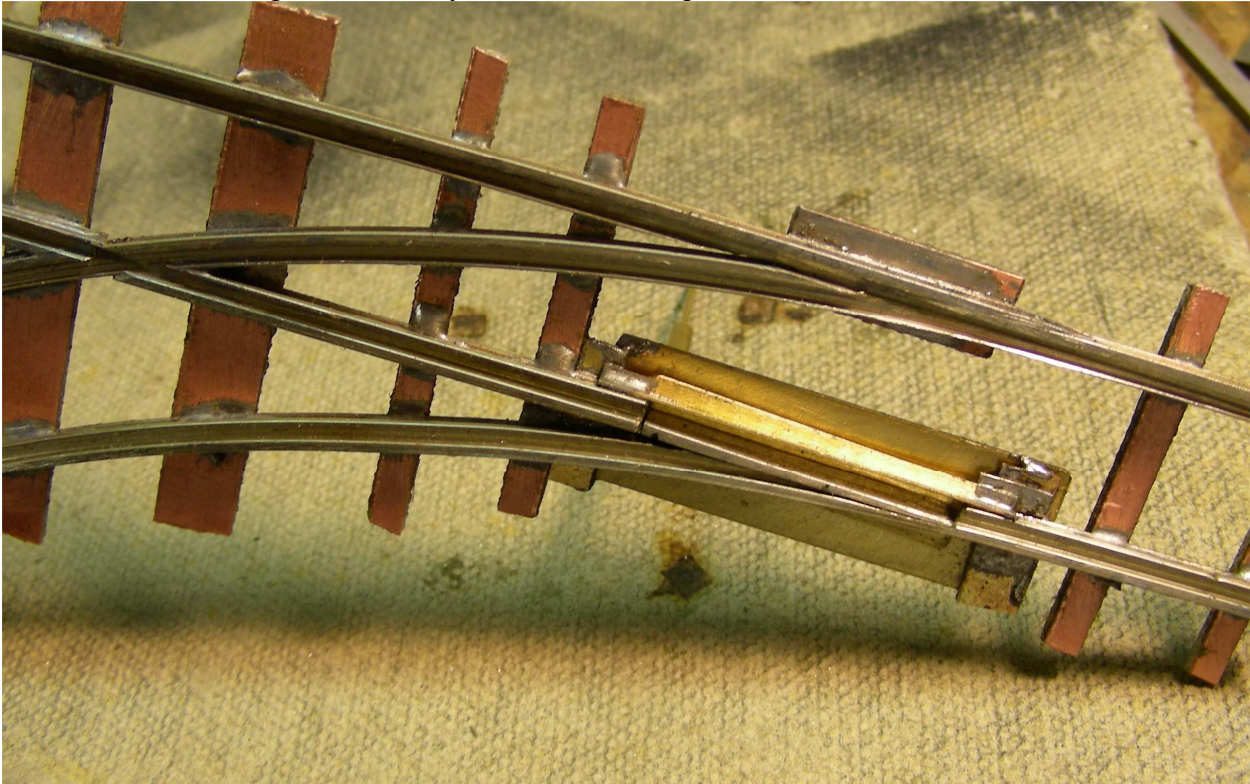
This picture shows all the brass pieces.



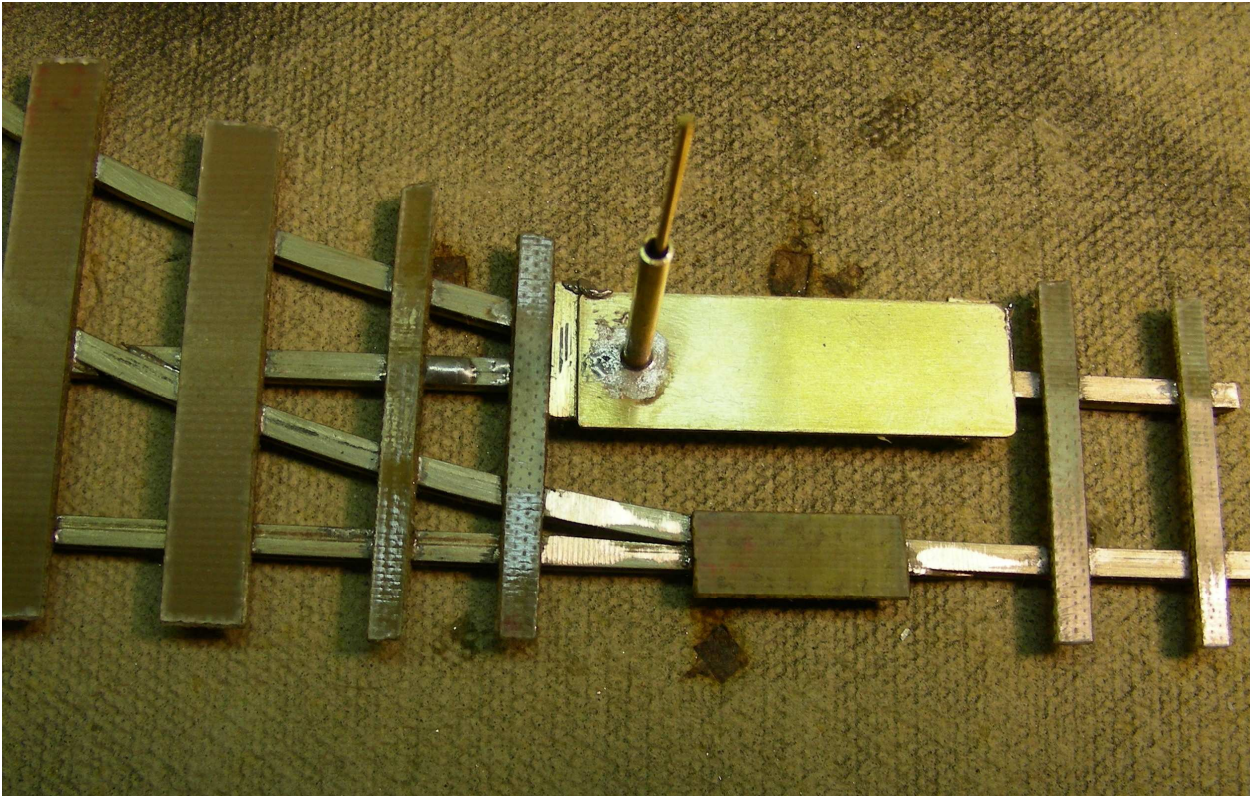
And this shows the point assembly in the base:



The turnout with the point assembly tack soldered in place:

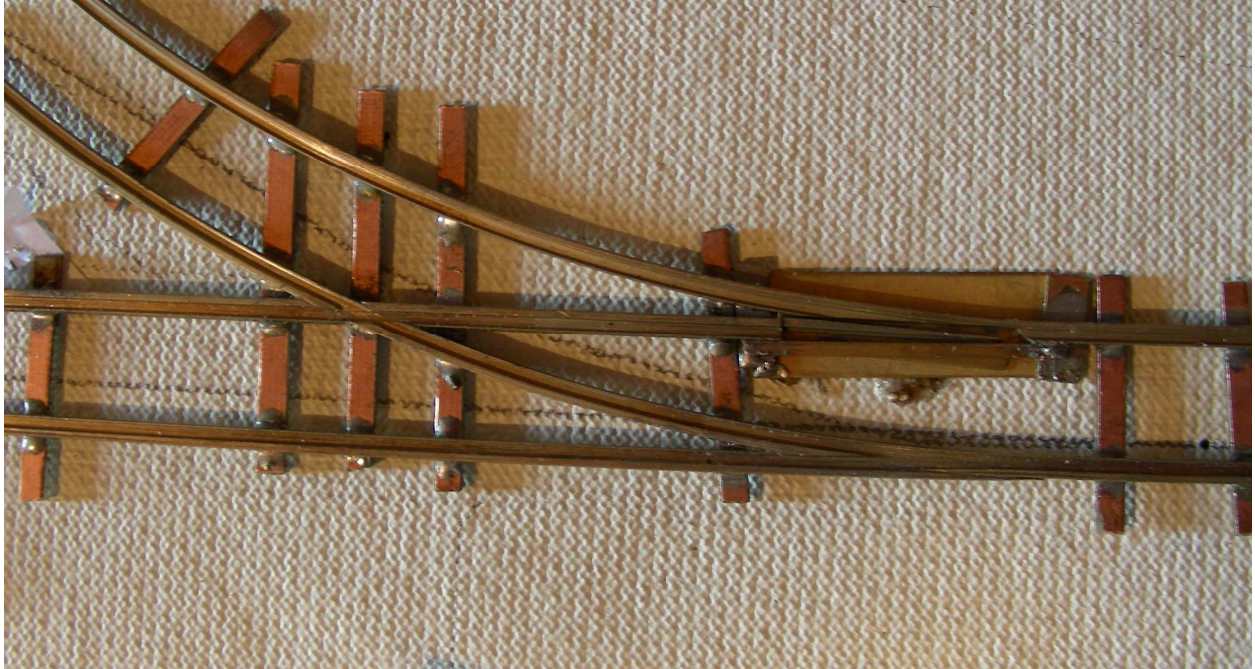


The view from underneath:





And the turnout installed on the layout.



All that is left to do is make a bend in the wire, slightly below the tubing to make a lever for attaching a spring or switch machine. Avoid too much pressure on this lever as it transfer all that pressure on the solder joint of the wire in the point.

Please provide feedback on this tip and/or your experiences building turnouts to the East Penn Web Master.