

Building A Stub Switch Using A Fast Tracks Assembly Fixture



Builders Guide



FAST TRACKS



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Fast Tracks Builders Guide UG20

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Fast Tracks was born out of my frustration with building accurate and reliable turnouts by hand. I just felt that there had to be a better way. So after a lot of experimenting and trial and error I came up with a solution that worked so well, that I decided to offer track assembly fixtures for sale to other model railroaders.

I have spent a lot of time 'sweating the details' and have worked hard to produce the highest quality product possible. If you are not 100% satisfied with your Fast Tracks product, or are not getting the results that you expected, then please contact me directly at service@fast-tracks.net and I will try and help you out, or arrange to refund your money.

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We also maintain an online discussion forum about Fast Tracks products on our website at www.handlaidtrack.com/forums. There you will find a host of information & advice from myself and other customers. Why not drop by and tell us how you are making out with your hand laid track project?

I also publish a personal blog on the Internet at www.bronx-terminal.com. I regularly post images, videos and comments about the progress I am making with my personal projects, so stop by and have a look!

Also, [Fast Tracks is on Facebook!](#) If you are a Facebook user, join our Fast Tracks page as I frequently update it with what is going on here during the day.

Again, thank you for your purchase. And please do not hesitate to contact me if you have any questions or problems with your product. I will do my best to reply within one business day.

Tim Warris & the staff of Fast Tracks
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www.fast-track.net

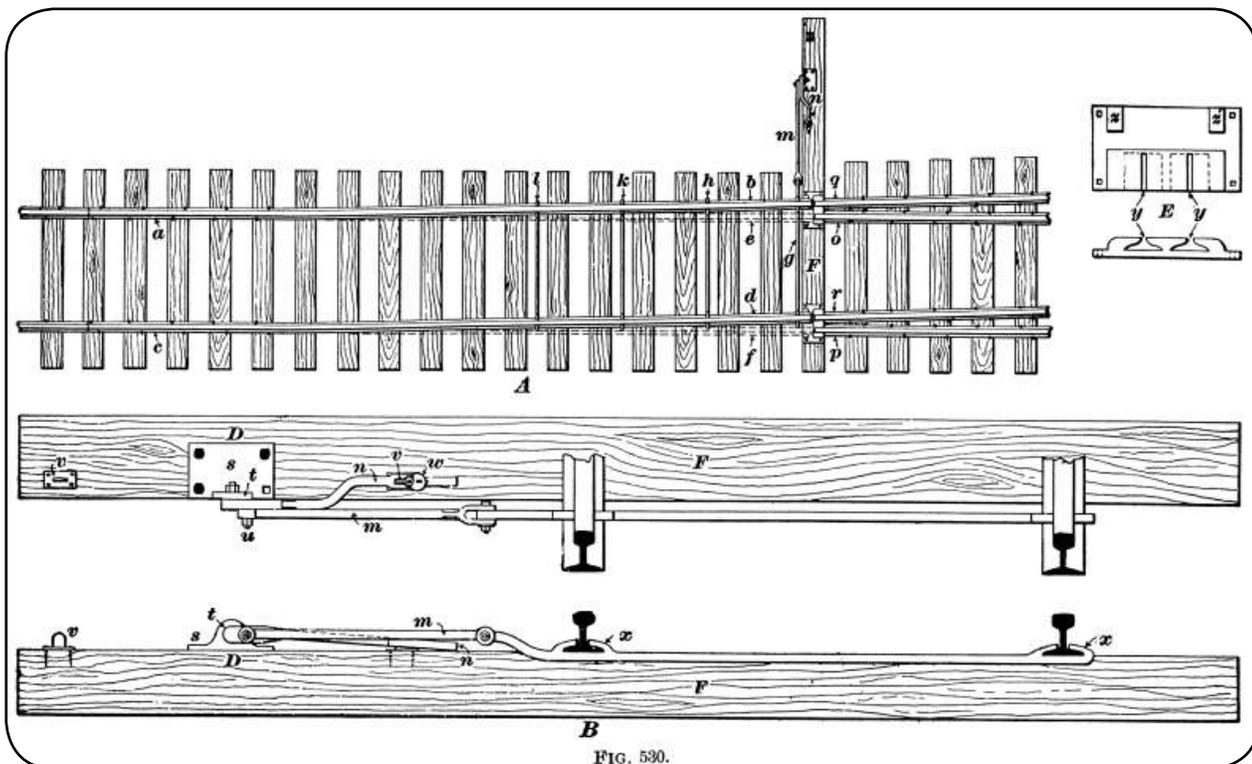


Building A Stub Turnout

Stub turnouts, or the more generic term, “Stub Switch”, are the precursor to today’s modern turnouts. Stub turnouts are different from modern turnouts in that there were no moving switchpoints. Instead the routes were changed by actually moving the rails leading up to the turnout. Using a manually operated switch stand, and some real muscle, brakemen would physically warp the rail leading into the turnout. These were much easier for the railroads of the day to build, but had a number of major drawbacks. They were very rough to travel over. The hard banging of wheels onto the ends of the rails caused damage and the rail had to be frequently repaired. And trains could only operate at low speed through the turnout as it was a bone jarring bump from one route to another.

Around the turn of the century most of these were replaced with their modern counterpart that used moveable switchpoints that eliminated all of the problems associated with a stub turnout. However backwoods logging and coal operations continued to use stub turnouts long after other types of operations dropped them, some are even still in use today.

Building a model of a stub switch is done in two parts. Part one is to build or prepare the upper portion of the turnout. The methods used to build the upper part of the switch are the same as building a standard turnout, so refer to our Turnout Builders Guide for detailed instructions for this part.



Original patent drawing of a stub turnout commonly used in the 19th and early 20th centuries

The second part of the process is to build a movable bridle - the part of the turnout that actually moved back and forth to select the route.

What makes stub turnouts a bit more difficult to construct is the need for a mechanical stop. Unlike a turnout with switchpoints, a stub switch has to have something to physically stop the movement of the bridle when it is in position. The prototype uses a cast part to hold the closure rails in place, and cast into this part are stops. Unfortunately nothing like this exists for our models, so this Builders Guide will describe a simple but effective method for building stops.

Prototype stub switches also have a series of bars fastened to the rails to hold them in place to allow them to be switched as a single unit. For our model we will be using a single PC board tie with rail joiners soldered to it to allow the rails to properly slide back and forth. This is a compromise that has to be made as there is no material that I am aware of that could be used to model the bars accurately and still have the necessary strength to keep the rails aligned. This tie will be extended out the side of the turnout to allow it to be reliably connected to either a switch machine or a ground throw.

A prototype stub turnout typically has only a single head tie (the long ties where the switch stand is held) so our model will also use a single head tie.

You can build a stub switch using any standard Fast Tracks assembly fixture with PC Board ties, and the matching QuickSticks laser cut ties.

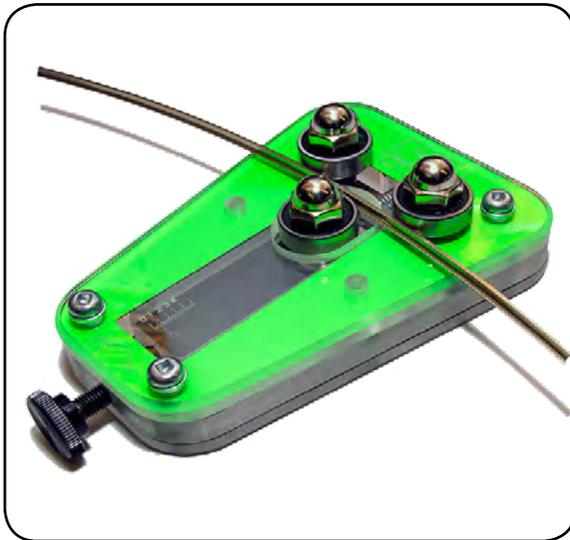
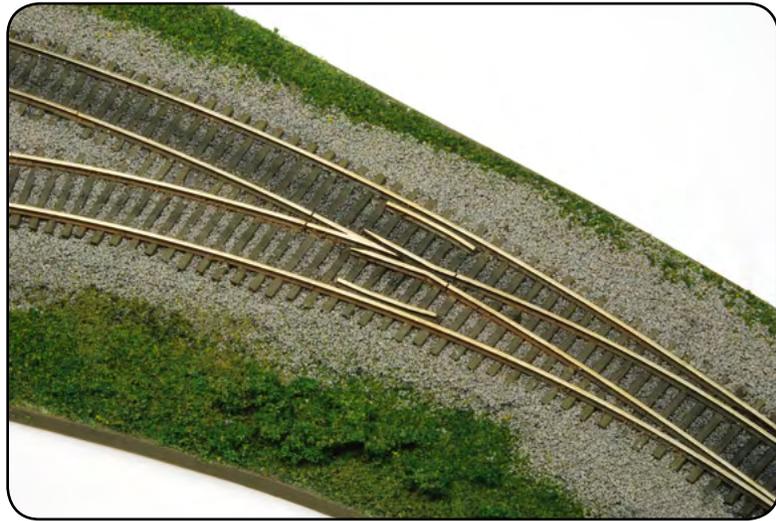
Craftsman Series Build

We recommend that you gain some experience in building standard turnouts before you attempt to build a Stub Turnout. This document assumes that you are familiar with the methods for building a standard turnout in a Fast Tracks assembly fixture, and that you have mastered basic turnout construction techniques and soldering skills.



Curved Stub Turnouts

To build a curved stub turnout, simply follow the instructions in this document. The only difference is that you need to curve the rail to match the curved rail slots before you insert the rail into the assembly fixture.



Our Rail Roller rail bending tool makes this very easy and is highly recommended. You can learn more about the Fast Tracks Rail Roller on our website at: www.handlaidtrack.com/tl-0004.php.



Related Documents

The following documents are referred to in this document and will be needed during construction. You may want to print copies of them now.

These documents will be included on the documentation DVD that you received with your fixture, or you can download the latest version from our website at:

www.handlaidtrack.com/documents.php.

- Building Turnouts Using Fast Tracks Assembly Fixtures - UG01
- Using The Fast Tracks PointForm Tool - UG10
- Using Fast Tracks PC Board Ties - UG09
- Using The Fast Tracks Rail Roller (Curved turnouts only) - UG12
- Developing Good Soldering Techniques - AN01

NMRA Compliancy & MMR Certification

Turnouts built with Fast Tracks tools and following the instructions provided in this document and in our Using Fast Tracks Assembly Fixtures video will be NMRA compliant.

Fast Tracks tools may be used to construct trackwork for your Civil Engineering certificate, however you should always confirm NMRA compliancy by checking the turnout using your NMRA track gauge.



Supplies You Will Need

1. Rail
2. Turnout PC Board Ties
3. Rail Joiners
4. Rail Spikes
5. Flat Washers (The thickness of the washer should be slightly less than a PC Board tie.)
6. Wood screws that fit the flat washers
7. Wood Ties
8. TwistTies (optional - you can use standard wood ties if you prefer.)



Part 1 - Building The Upper Turnout

Start by building a turnout that includes everything down to the tie above the throwbar. Image 1 shows all of the necessary ties placed into the fixture.

Just build the turnout as you normally would with the stock rails cut just below the third tie. (Image 2)

**Click The Images For
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The turnout is built a bit longer than necessary and will be trimmed to length. Image 3 shows the finished trackwork set onto the QuickSticks ties. This will help you determine where you need to position the head tie.

Image 1

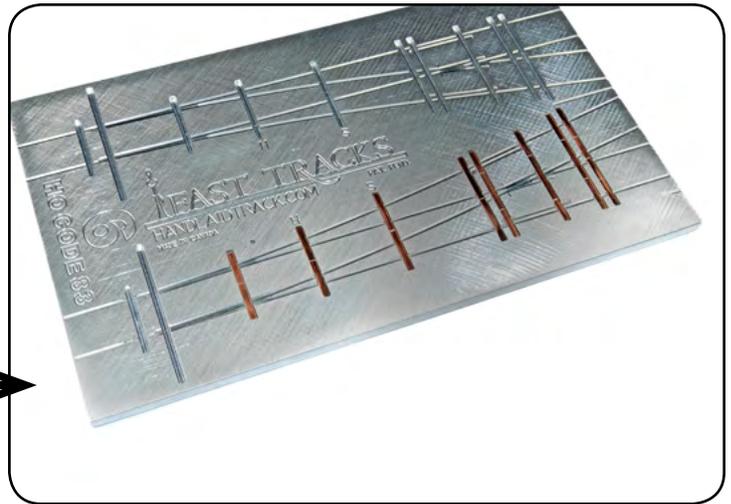


Image 2

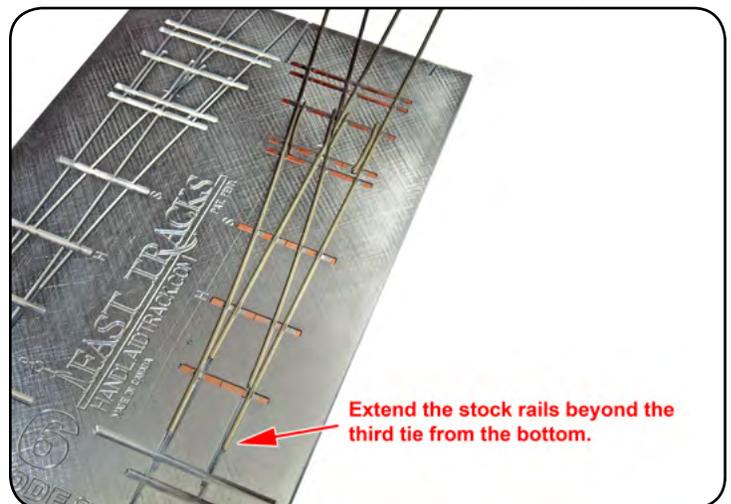


Image 3

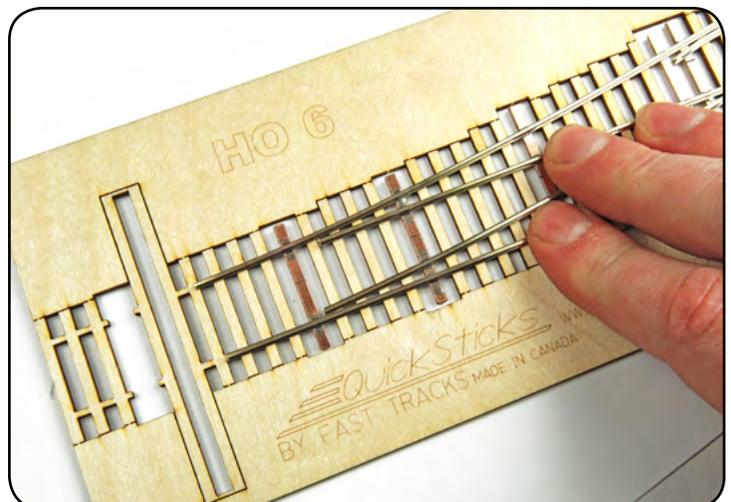
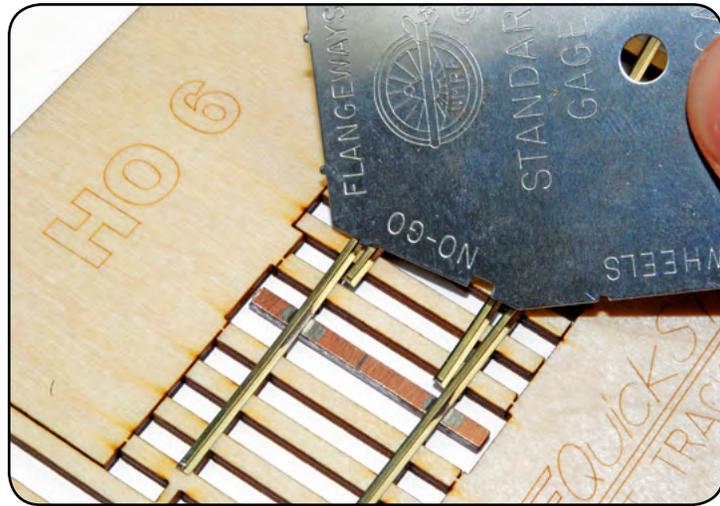


Image 4

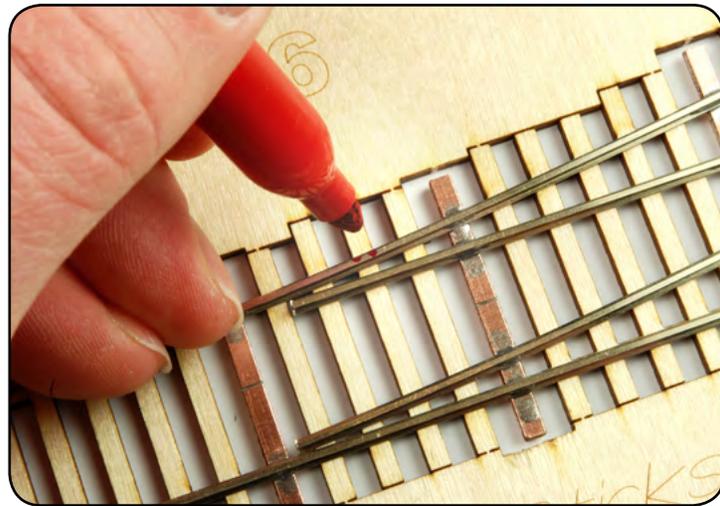
The moveable bridle rails will meet the turnout at a location where the stock and closure rails are spaced approximately the same distance apart as the flangeways are in the frog area. To determine this location use the “NO-GO” tab on an NMRA track gauge to locate where the rails are far enough apart. (Image 4) You want this position to be at the same location as a wood tie.



Mark this location onto the rail head with a marker. (Image 5) We will be soldering an additional PC Board tie at this location to act as the head tie.

Image 5

Now remove the assembly from the fixture and carefully solder a PC Board tie at the location you marked on the rail. (Image 6) Be sure to position the long side of the tie on the side where the switch machine/ground throw will be used.



Confirm that the tie is sitting parallel to the other PC Board ties before soldering it into place. It may help to tape the turnout and the tie onto a flat surface to keep everything stable while soldering.

Image 6

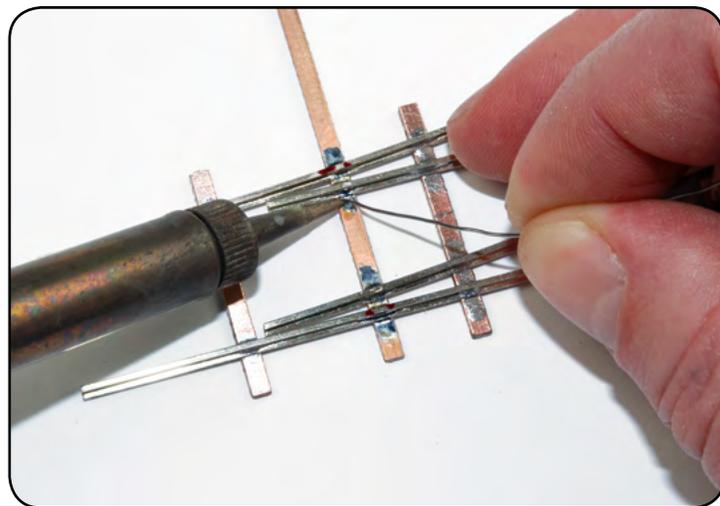
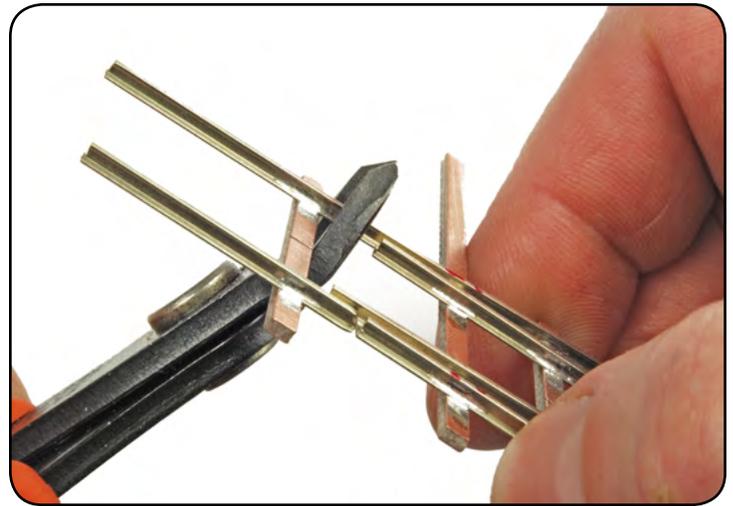


Image 7

After soldering the head tie into place, the rails are cut off just past the end of the head tie. Don't try to cut the stock and closure rails at the same time, or cut too close to the head tie as you will damage the rail. Instead cut the stock rails off first. (Image 7)



Then cut the stock and closure rails off close to the edge of the tie, but not right next to it. You will file the rails flush to the tie in the next step. (Image 8)

Image 8

Image 9 shows the rails cut close to the tie. You want to cut the rails carefully to avoid crushing or deforming them.

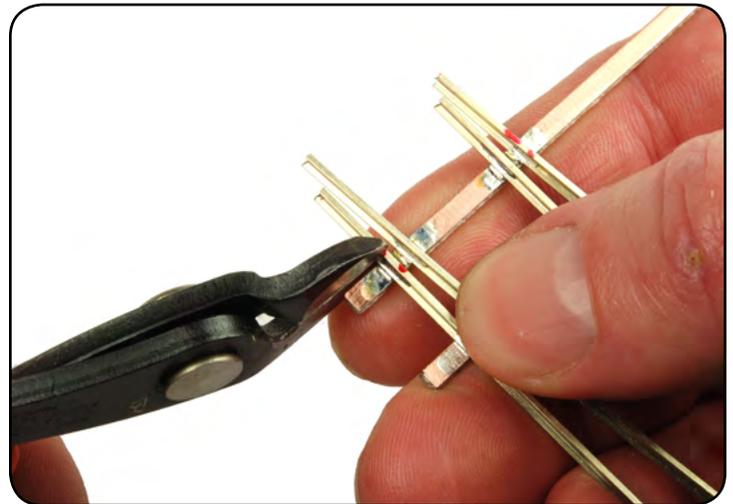


Image 9

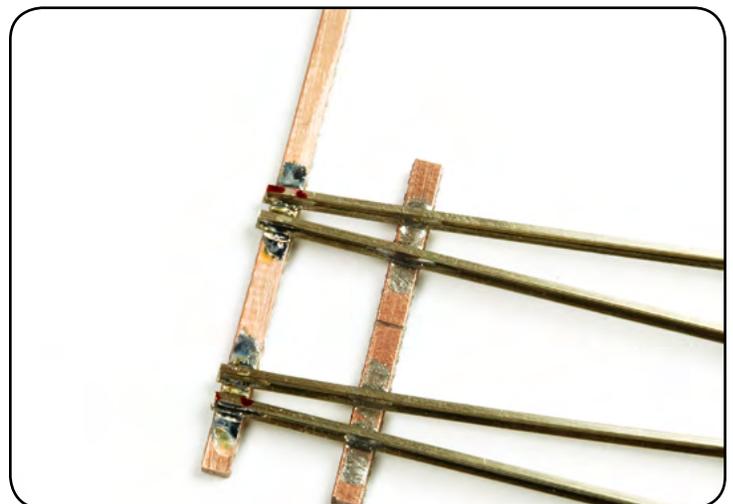


Image 10

Using a large file, file the rail flush to the edge of the PC board tie. (Image 10)

With the rail filed flush, the upper half of the stub turnout can be set aside as we prepare the moveable bridle. (Image 11)

To allow the rails to properly move in the bridle we will use two rail joiners soldered to a PC Board tie. These joiners will act as guides that will allow the rail to slide up and down in the joiners when the rails are moved back and forth. (Image 12)

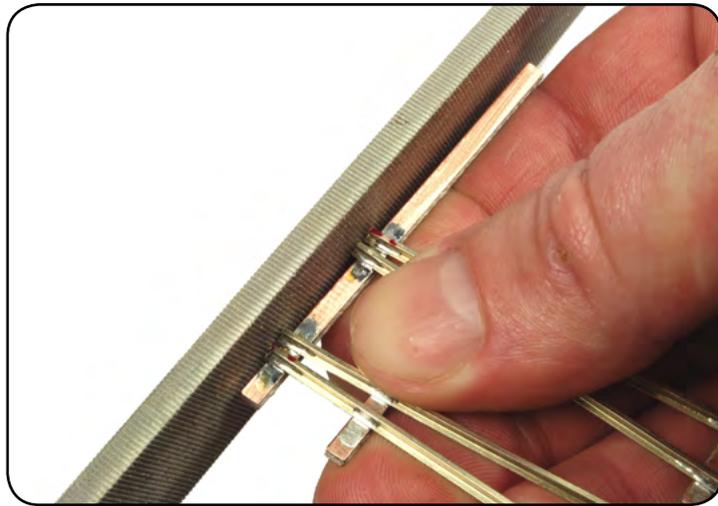


Image 11

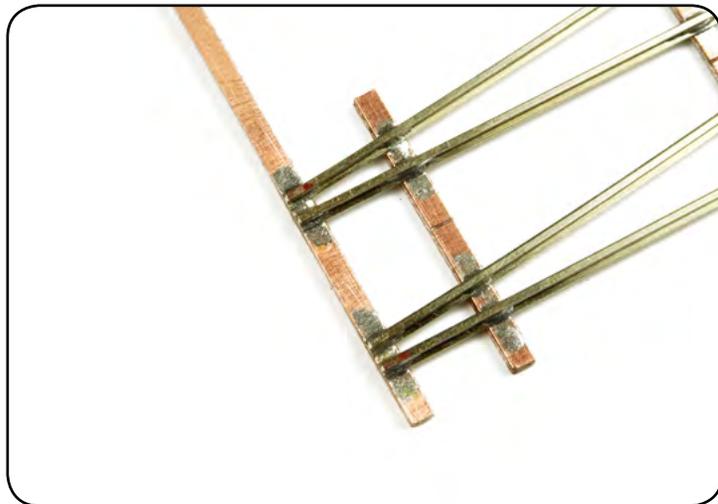


Image 12



Image 13

Rail joiners are a bit too long and will need to be cut the same width as a PC Board tie. The PointForm tool will work well as a clamp to hold a piece of rail in place while we cut two rail joiners to length.

Slide a rail joiner onto a length of rail held in the PointForm tool. Position the rail joiner so that it extends by the width of a PC Board tie beyond the end of the rail. (Image 13)

Using a jewelers saw and a fine tooth blade cut the rail joiner off flush to the end of the rail. A cut-off disk in a rotary tool also works well for this. (Image 14)

There is a small tab on the end of the rail joiner. Nip this off with a pair of rail cutters. (Image 15)

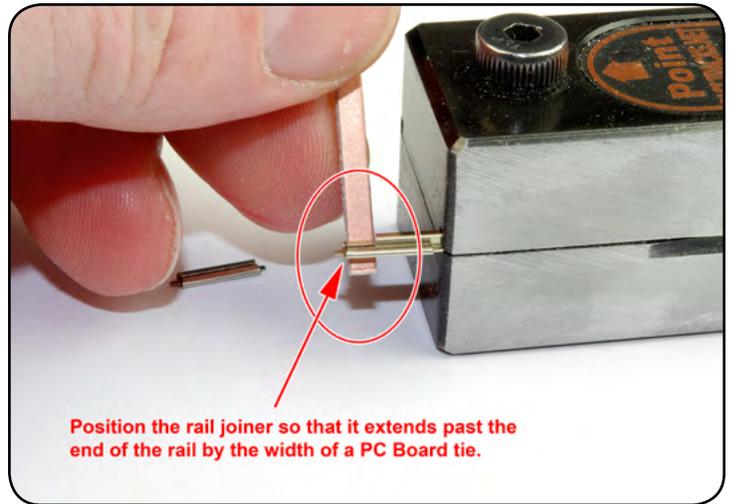


Image 14

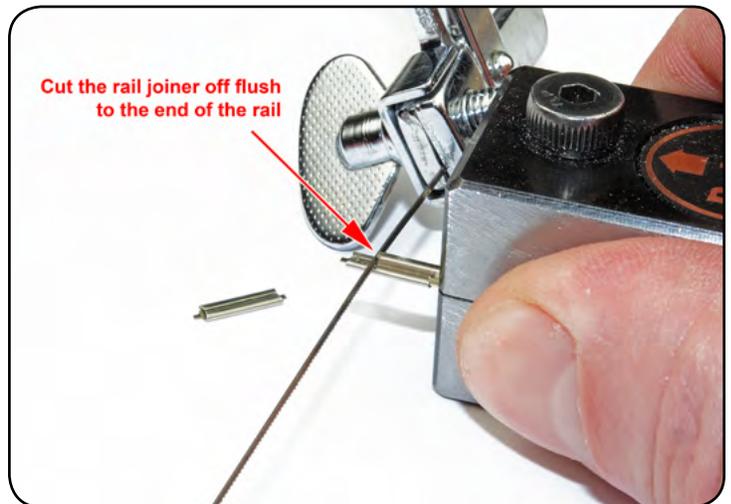


Image 15

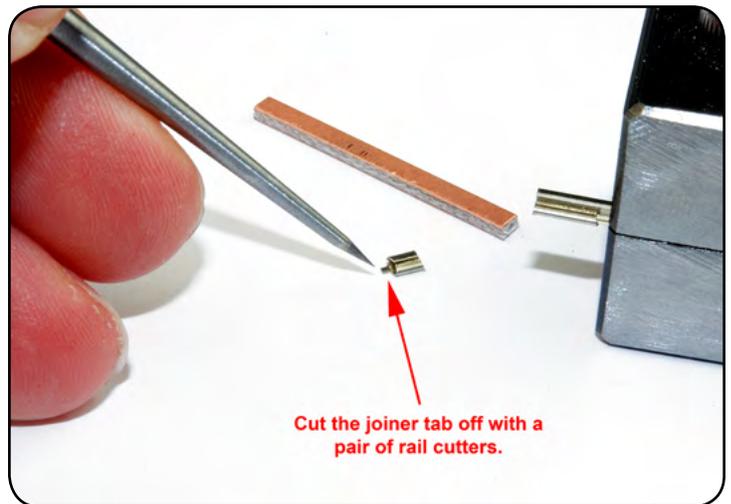


Image 16

Slide the rail joiner section onto a length of rail to hold it steady and carefully file off any burrs. (Image 16)

Next we need to solder the rail joiners onto the PC Board ties. To make sure that the joiners and ties are properly spaced and held square, it is easiest to use the Assembly Fixture to hold everything in place while you are soldering.

The PC Board throwbar tie at the end of the bridle needs to be extra long as the switch machine or ground throw needs to be offset to one side of the bridle.

Here I am using the end tie pocket, and two additional pockets about 3" back. (Image 17) This is the section that will flex.

Cut two lengths of rail about the length of the fixture for the bridle and slide the rail joiner sections onto each of rail. (Image 18)

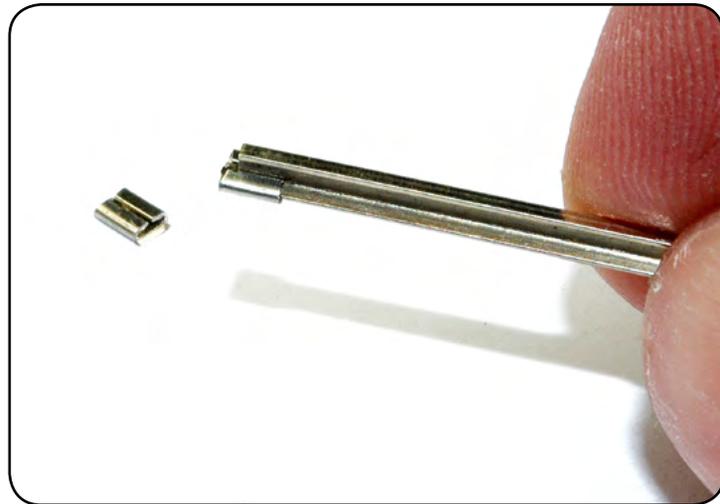


Image 17

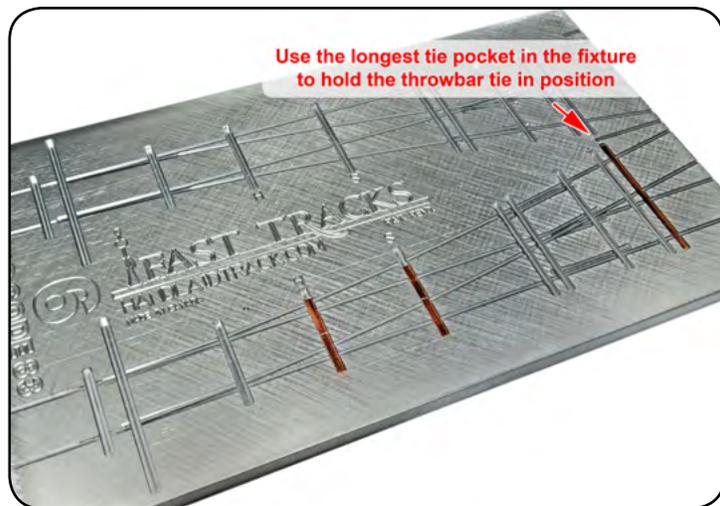
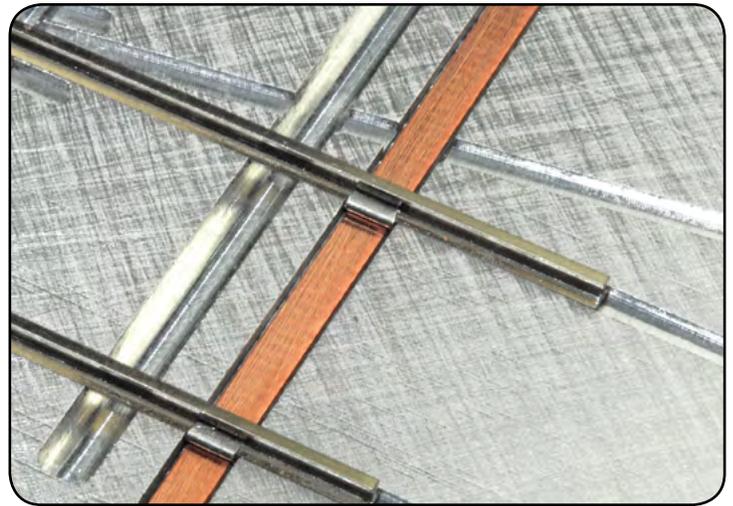


Image 18



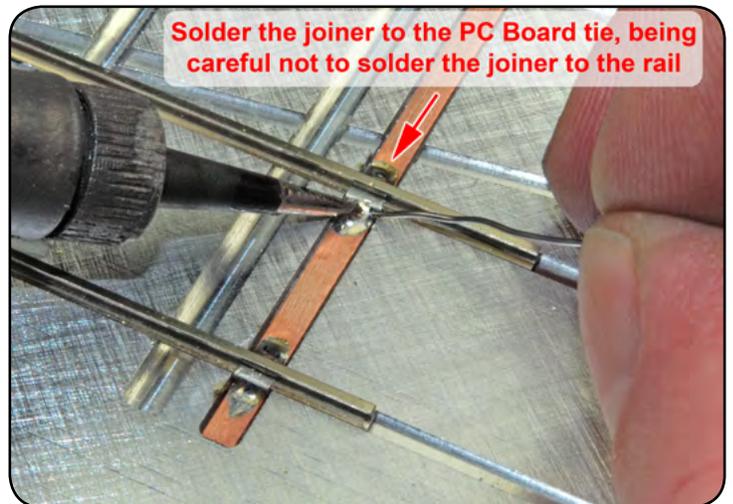
Image 19

Insert the rails into the fixture and align the rail joiner sections onto the long tie at the end of the bridge. The ends of the rails should protrude at least a couple tie lengths past the end of the PC board tie. (Image 19) We will trim these off later on.



Flux and solder the rail joiners onto the PC Board tie. DO NOT solder the rail to the rail joiner, the rail must be able to slide within the rail joiners. (Image 20)

Image 20



Solder the rail to the other PC Board ties in the fixture. (Image 21)

Image 21

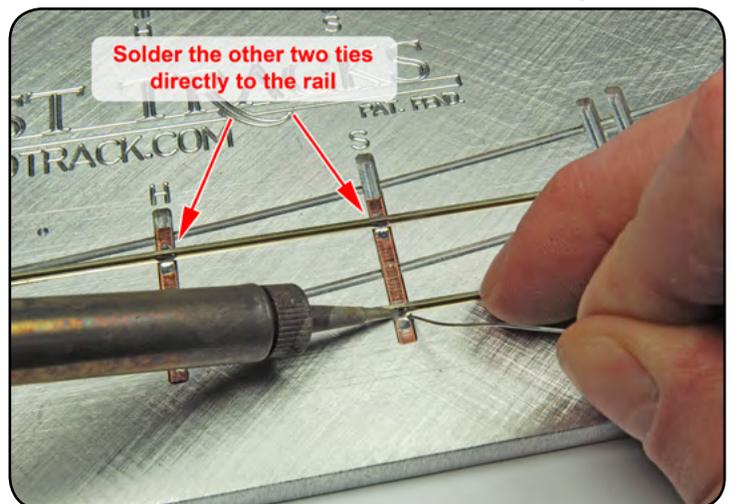


Image 22

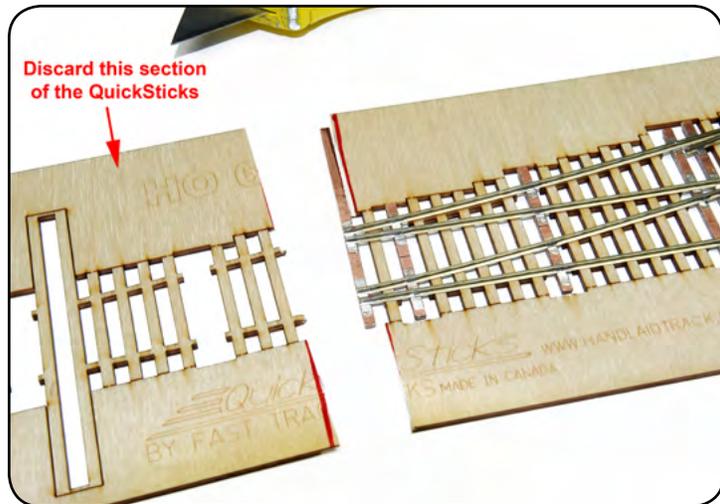
This section can now be removed from the fixture. The rail should easily flex from side to side from the long tie at the end of the bridge. (Image 22)



Set the turnout on top of the QuickSticks and mark the end of the last wood tie and cut the QuickSticks at this location. (Image 23) Discard the bottom section with the head ties and glue the trackwork onto the QuickSticks using Pliobond adhesive.

Image 23

The turnout can now be glued into place on the roadbed along with the wood crossties under the bridge. (Image 24)



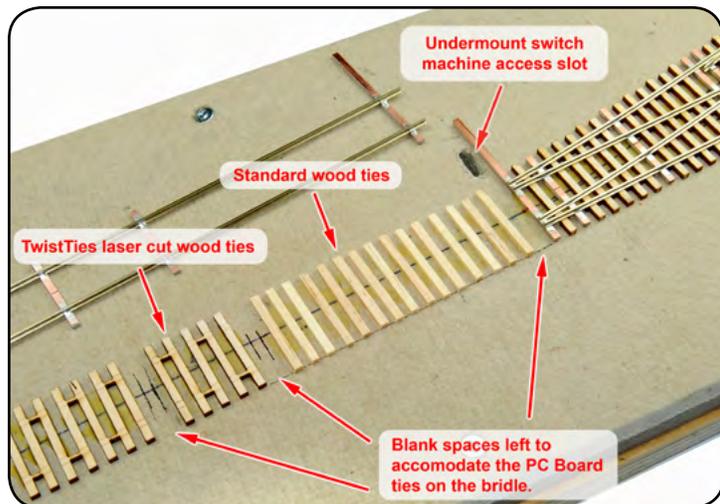
You need to use standard wood ties under the section of the bridge that will flex back and forth as shown in Image 24.

You can use either standard wood ties or Fast Tracks TwistTies for the rest of the switch. Here we are using TwistTies.

Gaps have been left to accommodate the PC Board ties on the bridge.

Image 24

Before setting the bridge on top of the ties, lightly sand the wood ties that are under the flexible section of the bridge to ensure that the rail heads will sit flush. Failure to do so will result in a bumpy turnout.



Finally, note that a hole has been drilled for the wire of an undermount switch machine. Due to tight clearances at the center of the turnout, the machine needs to be mounted offset to the tie.

Position the bridge onto the wood ties, ensuring that the PC Board ties

are properly centered between the wood ties. Then using a scribe or sharp knife, mark the location of the end of the upper section of the turnout onto the bridle rails. (Image 25)

Carefully trim and file the rail to length. Take care to ensure a good fit with the smallest amount of clearance possible. (Image 26)

To keep the throwbar tie in its proper location we will fashion small keepers from spikes.

Using a scribe or other sharp object, carefully mark the location where these spikes will be inserted into the roadbed. Be certain that the spikes are offset far enough from the rail to allow the rail to flex into position.

Notice that the copper has been filed off the top of the PC board throwbar tie. This is to keep the shiny surface from showing after it has been used for a while. (Image 27)

Image 25

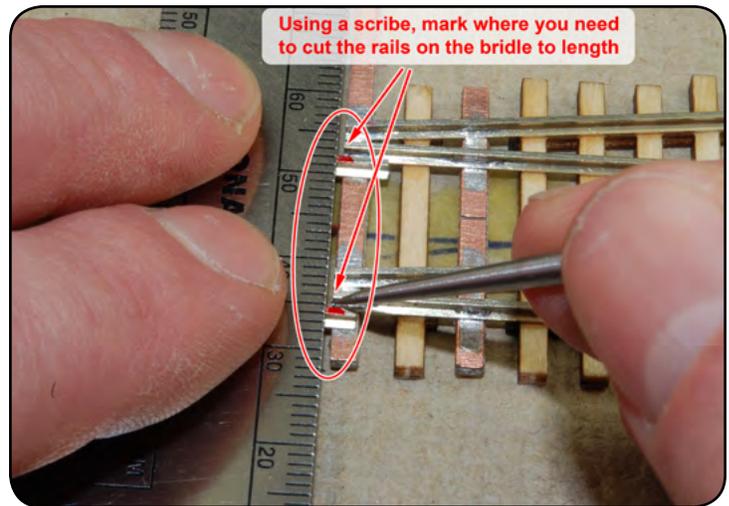


Image 26

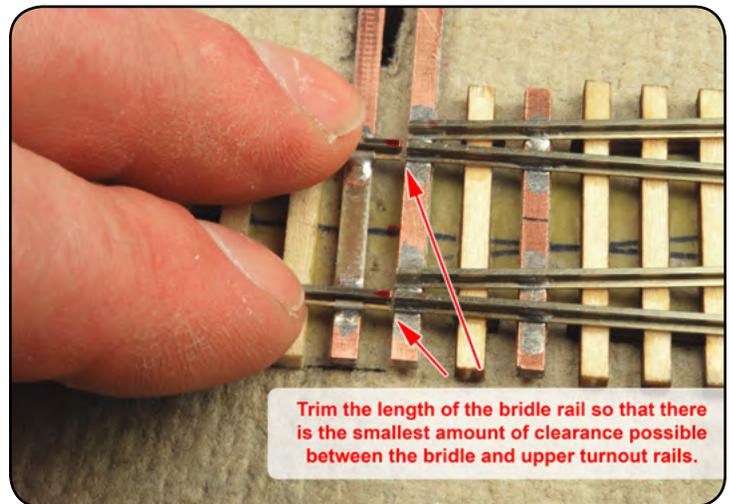


Image 27

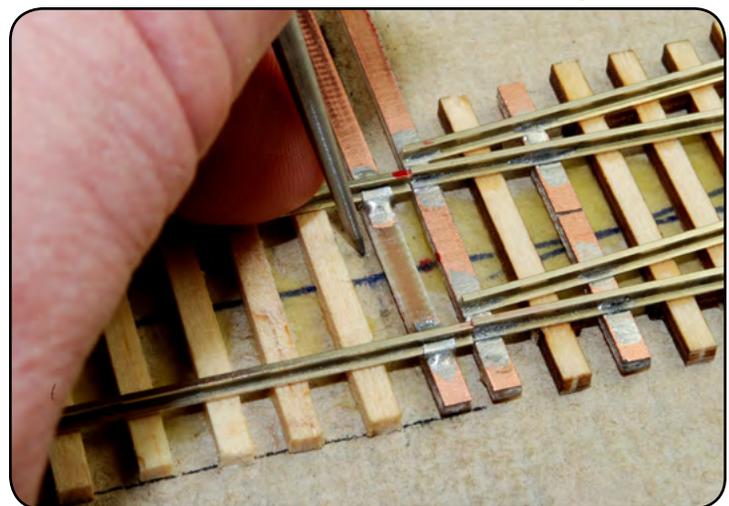
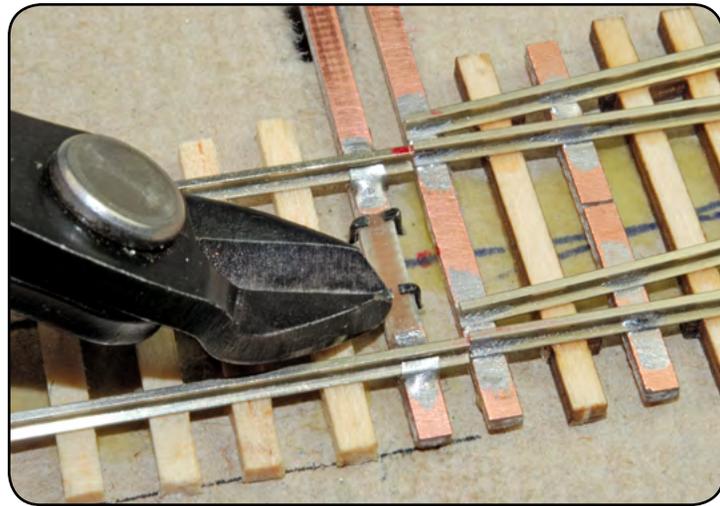


Image 28

Carefully insert the spikes into place, capturing the PC Board tie but still allowing it to slide freely. (Image 28) (Image 29)



To build a reliable, adjustable stop for the bridle we need to make a couple of eccentrics from two small washers. These washers need to be thick enough that when they are mounted onto the roadbed the end of the bridle tie will sit against them so they act as a positive stop.

Clamp the washers into a vise and file one side into a slight arc. Using a bench top belt sander will speed this process up considerably. (Image 30)

Image 29

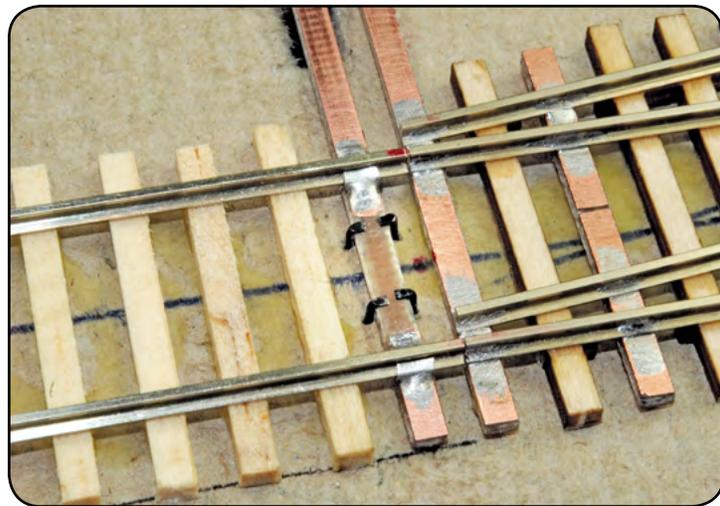
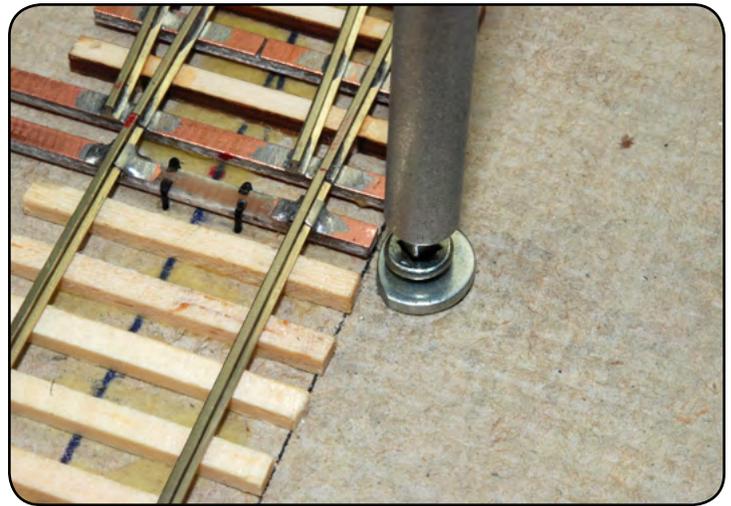


Image 30



Image 31

With the bridle in position for the straight route, screw the washer into the roadbed. Leave a small amount of clearance between the end of the bridle tie and the washer. (Image 31)



Now carefully rotate the washer until the tie sits tight against it and the rails line up precisely. (Image 32)

Repeat this process for the other end of the bridle tie and adjust into position for the diverging route. (Image 33)

Image 32

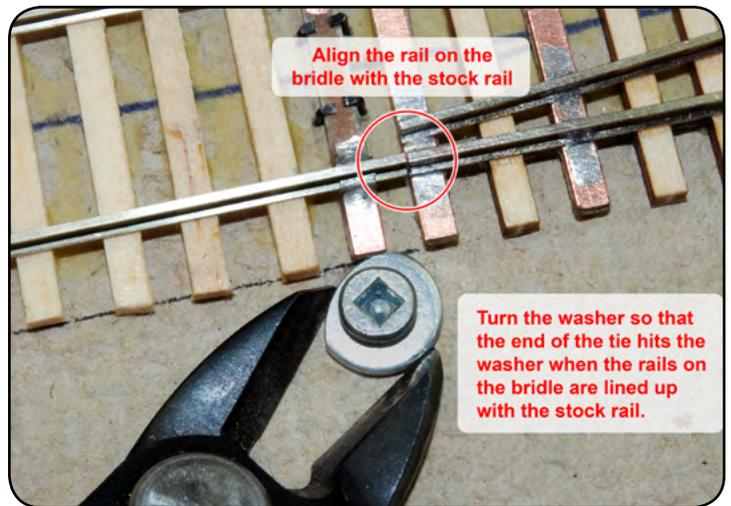
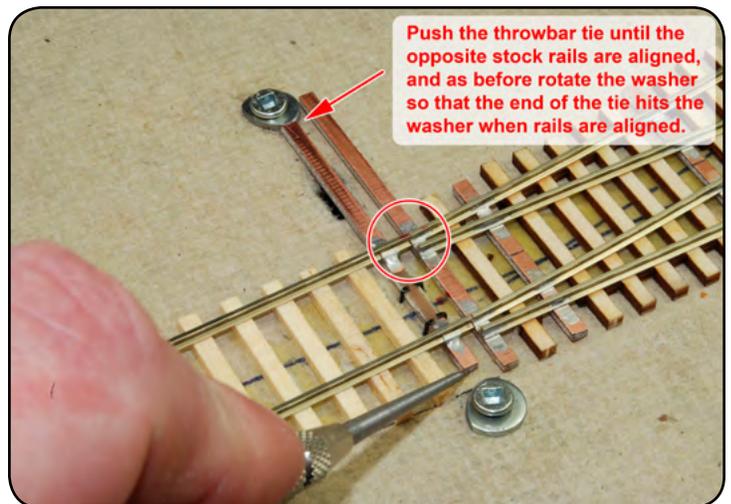
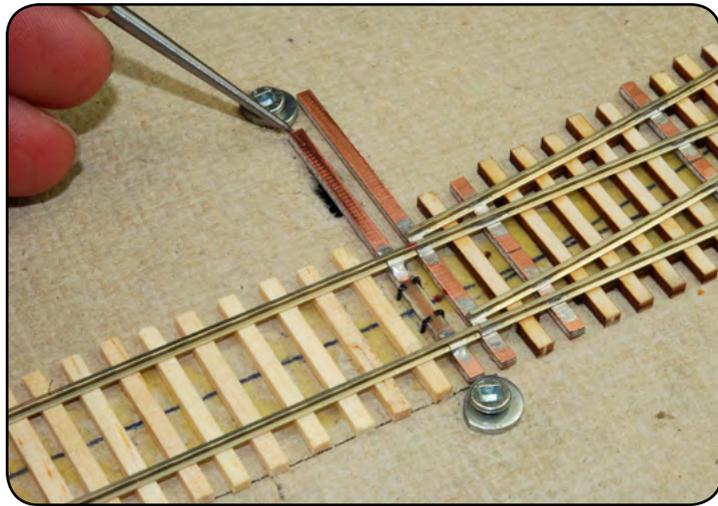


Image 33



Double check the alignment of the
bridle relative to the turnout, making
adjustments as necessary. (Image
34)

Image 34



Secure the washer to the roadbed
with a thin CA adhesive. Don't glue
the bridle to the roadbed! (Image
35)

Once the glue has thoroughly cured,
remove the screws. The washers
will be buried under scenic materi-
als when the turnout is ballasted in
place.

That's it! The turnout is complete.
Attach your favorite switch machine
or ground throw, wire it up, and it
is ready to deliver years of reliable
service.

Image 35

