Building a Substation Car for the CG&W

By Martin Brechbiel

I saw a reprint of an article by William Shopp on building a substation car for your electric railway. I have no idea from what publication it had been pilfered, probably an older *Railroad Model Craftsman*. But it was pretty basic in direction and generic, and then left a lot up to the modeler's discretion. Having some small component of my modeling interest resident in traction, I thought that this would make a nice simple project to pursue and get a unique piece of rolling stock at the interface of traction and steam modeling.

First, this car needed a good solid base and that starts with the usual flat car blank. But then that blank gets modified to add a round end for interfacing as a traction car with a radial coupler at one end. So once the basic flat car frame was assembled, I pulled out a resin casting left over from many years ago when I was scratchbuilding CERA traction freight trailers (**Photo 1**). While this is a resin component from my parts bin, one could easily make and shape this from a bit of basswood. The same decking on the flat car was applied to the resin part (**Photo 2**). In this case that's not quite the usual flat car blank to build.

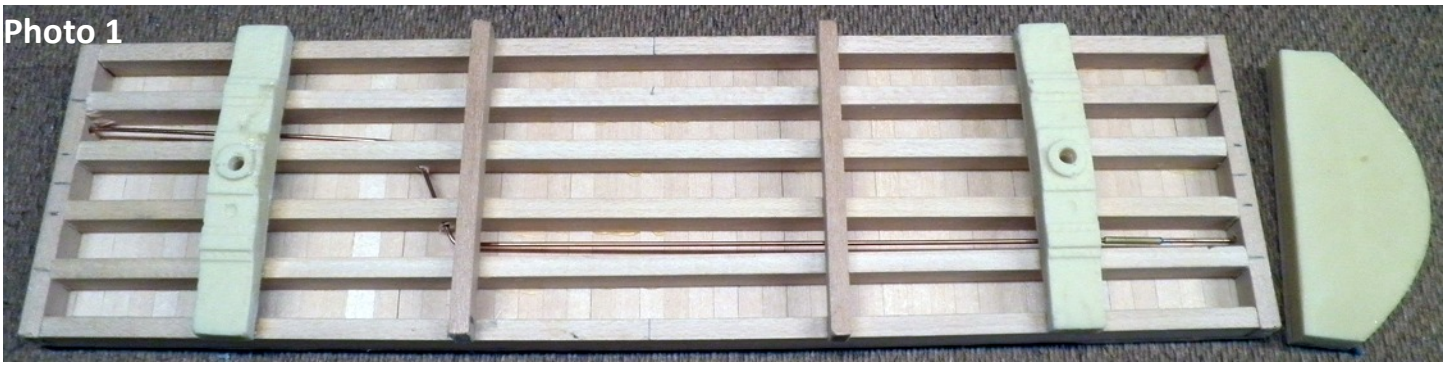


Photo 1

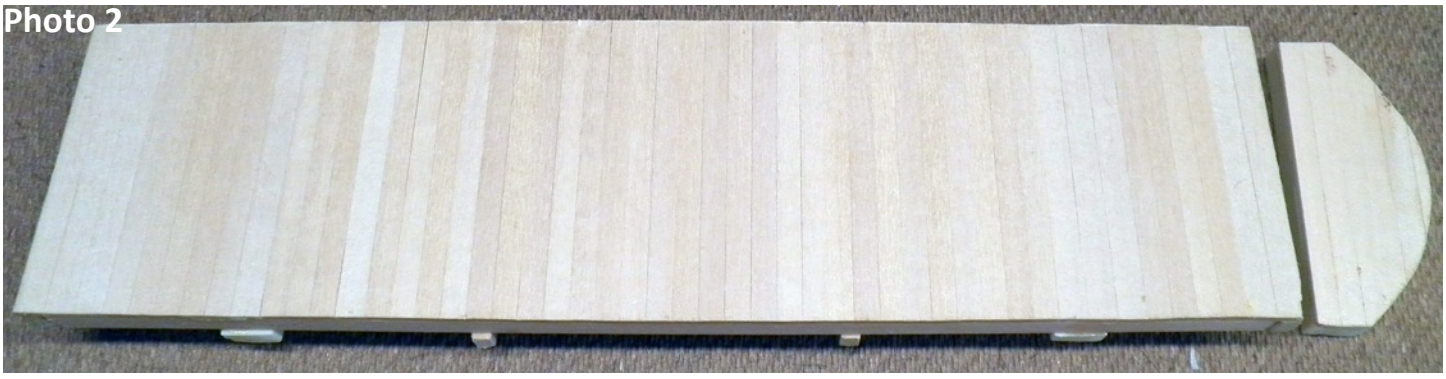


Photo 2

Adding the truss rod system to the underbody took a little modification to accommodate that round end addition. If you look at some of my other articles, I generally run the truss rods through the car using surgical silk anchoring it at each passage through the end with a larger nbw casting. After I had installed the full underbody, I had to hollow out the resin end and also trim off the bolt heads of the nbw castings to get the end joinery to line up tightly (**Photo 3 next page**). Once set into place and secure with Goo and CA, I closed over that hollowed out area and then rest of the exposed resin with more decking (**Photo 4 next page**).

Photo 3

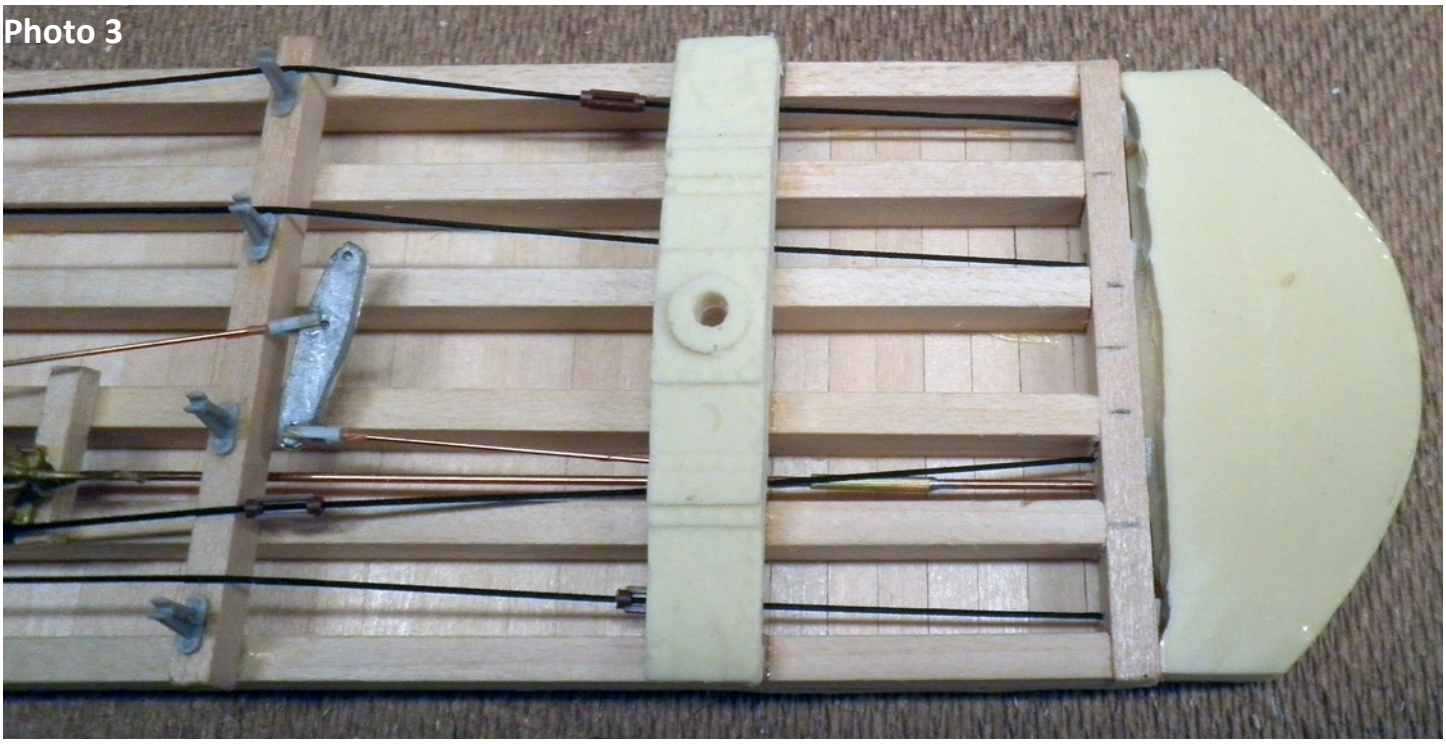
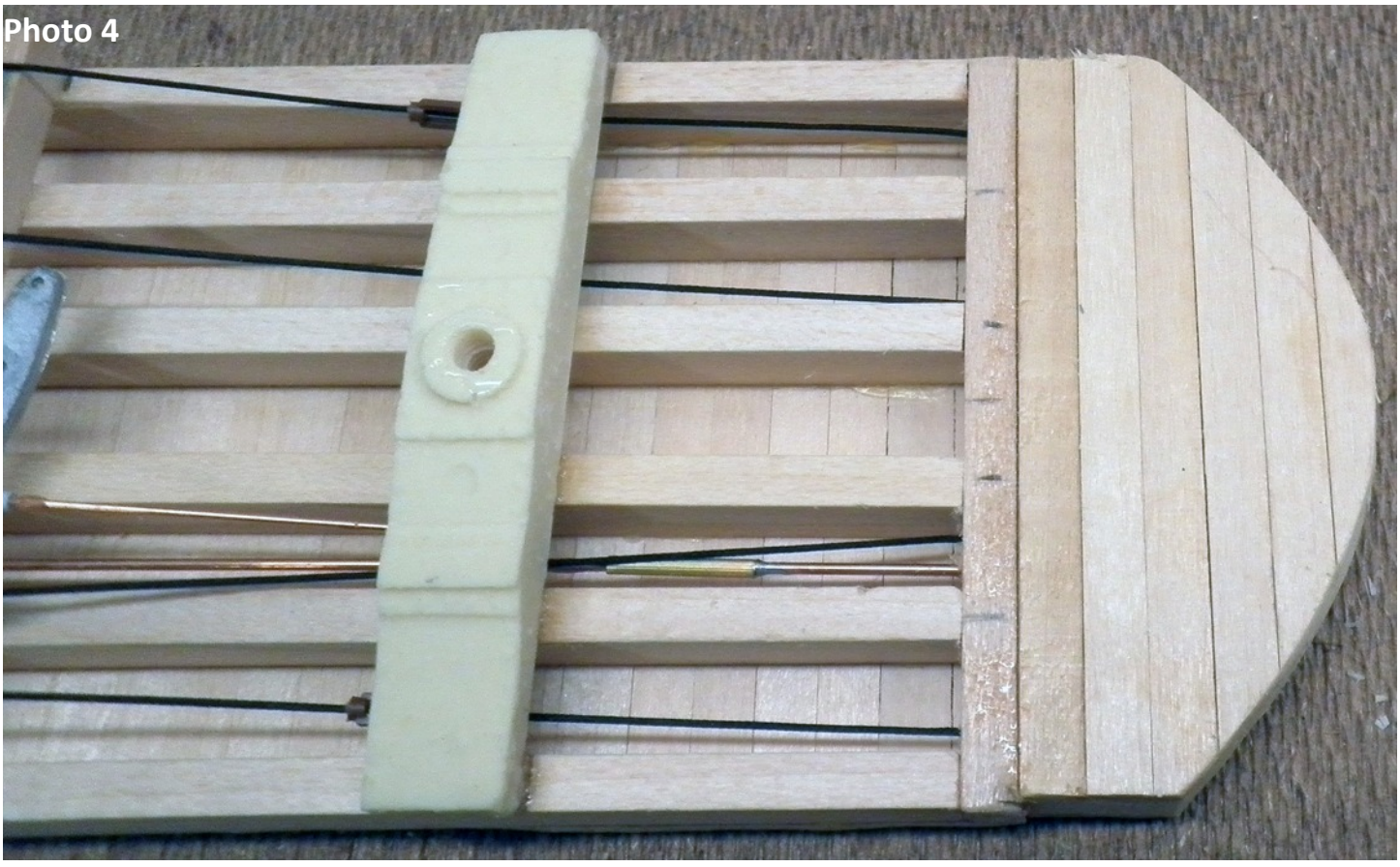


Photo 4



I cut out two sides and two ends to set the dimensions of the house part of this car, and then also to get the roof stock roughed into size (**Photo 5 next page**). The roof started out with a regular length of milled freight car roof stock. The overhang on the sides was extended slightly. Then the end was capped over to match the sides of house length. After that was set, the roof was extended to add an amount of overhang similar to the sides such the cut out ends would rest under the roof (**Photos 6-8 next page**).

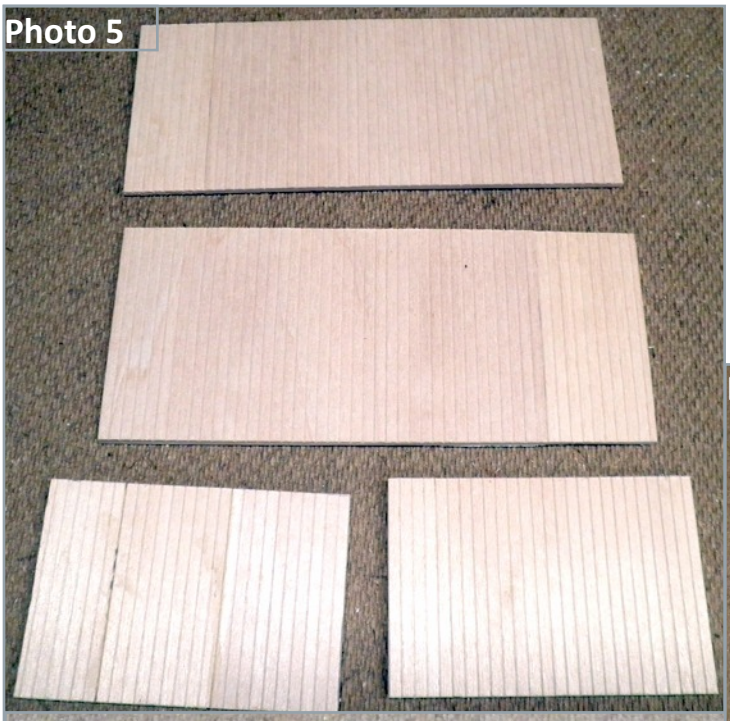


Photo 5


Photo 6


Photo 7


Photo 8

Going back the sides, one side was fitted for a door with some milled "z" stock. Ladders from BTS were assembled from laser-cut parts (**Photo 9**). The door was built up from 1/32" scribed siding and some HO 1" x stripwood such that it fits up under the "z" stock. Two white metal vent castings (Scale City Designs) were added and then the door was put in place along with a few brass details (**Photos 10-12**). The other side did get a ladder and a single metal vent casting.


Photo 9

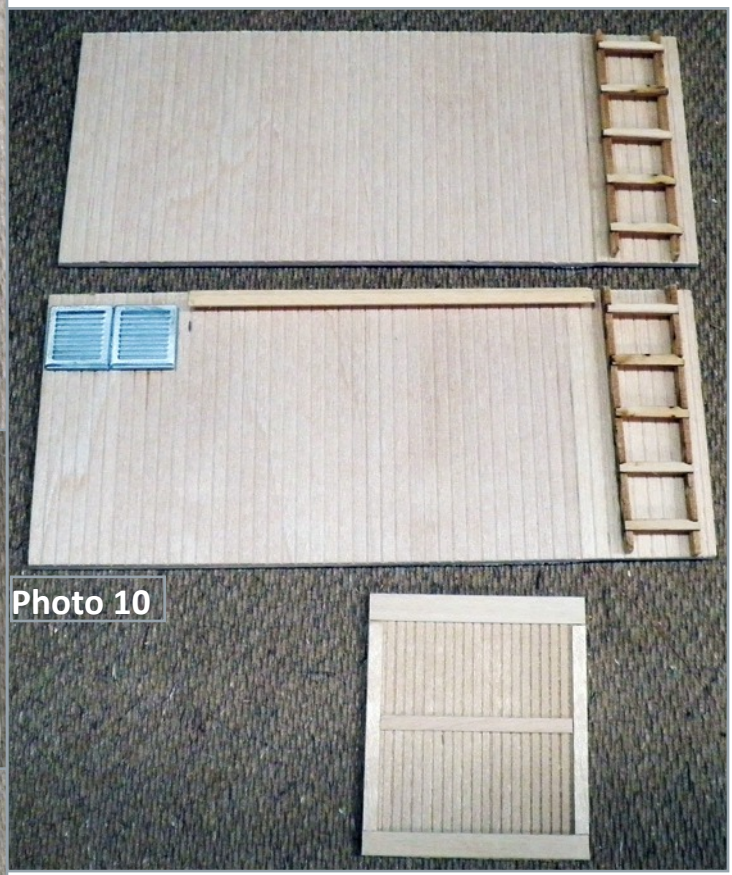


Photo 10

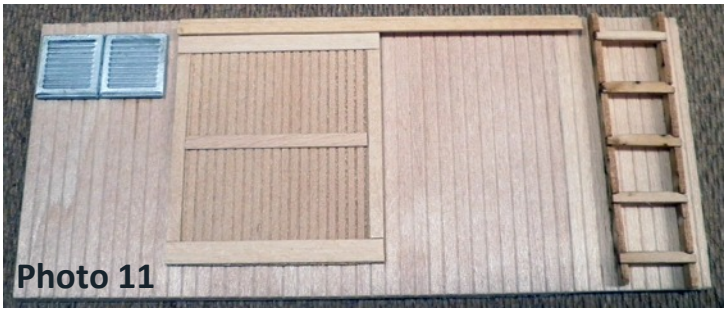


Photo 11

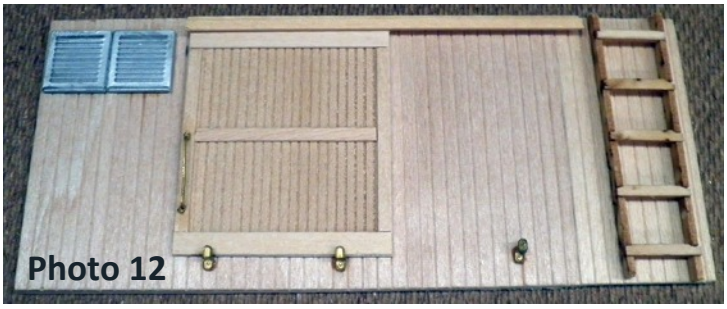


Photo 12

The sides were mounted to the car base, assembled together with the roof, and the and back end was added. These also had been modified with three white metal vent castings and another ladder (**Photos 13-15**).

Photo 13

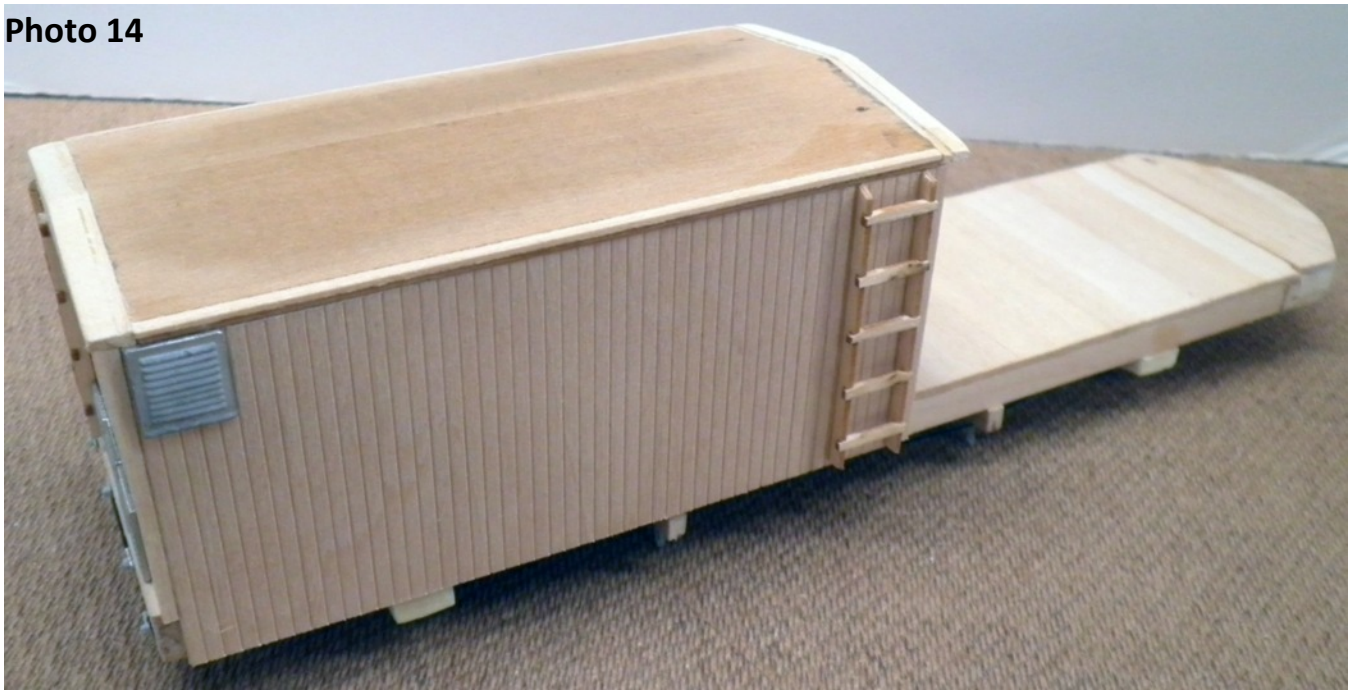
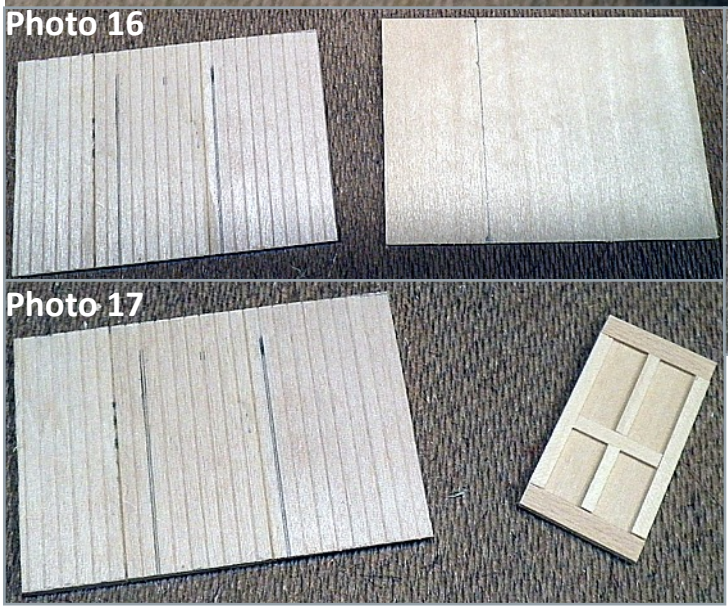
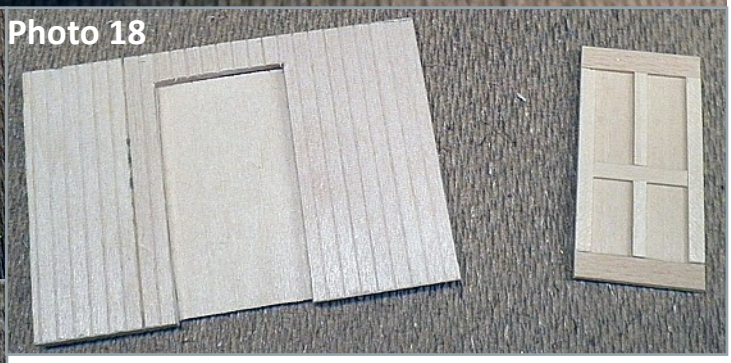


Photo 14

Photo 15





The remaining end was built up from scrap scribed siding. A door was built up on top of some 1/32" basswood and framed out with some various HO 1" x stock stripwood (**Photos 16, 17**). The location for the door was sketched out on the scribed siding. This was opened up and some more 1/32" basswood was glued to the back of this end for both reinforcement and as a surface for the door to rest against and be glued into place (**Photo 18**).

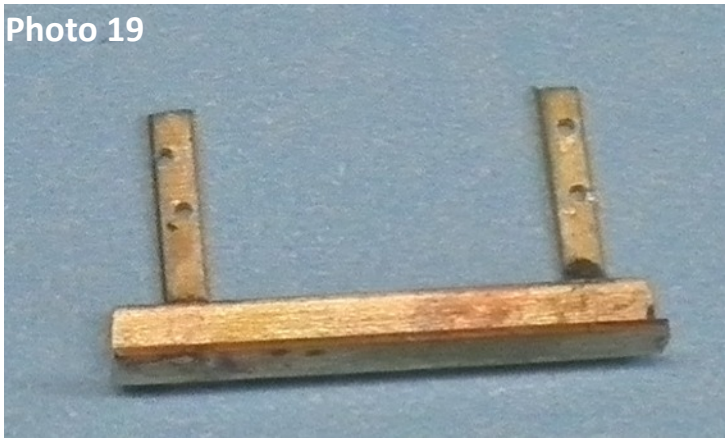


Photo 19

The side door needed a step. This step was fabricated by soldering some 1/8” angle and some 0.015” x 0.060” brass. Holes were drilled in the flat stock to accept pins for mounting to the car side (**Photo 19**). Some assorted stirrup steps and one fabricated step (0.015” x 0.060” brass) and a grab iron were added to the side without the door. A grab from an older Stewart-Lundahl kit was added next to the ladder. Grandt Line stake pockets were added to the side sill (**Photo 20**). The car side with the door also received stirrup steps and the larger fabricated step was glued and pinned into place (**Photo 21**). This photo also provides a good side view of the K brake cylinder and truss rod system.

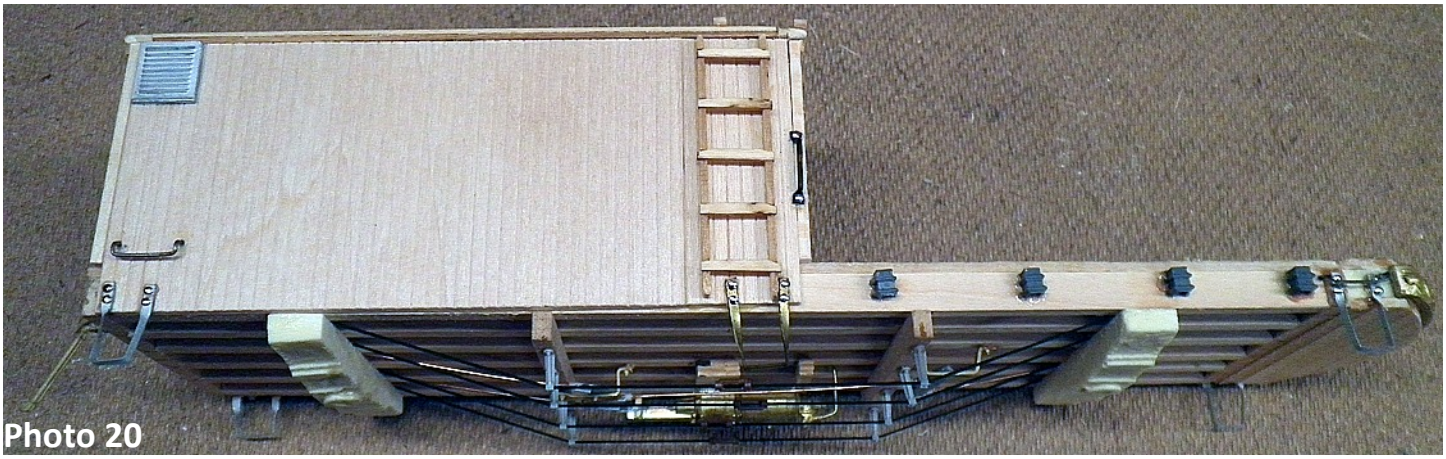


Photo 20

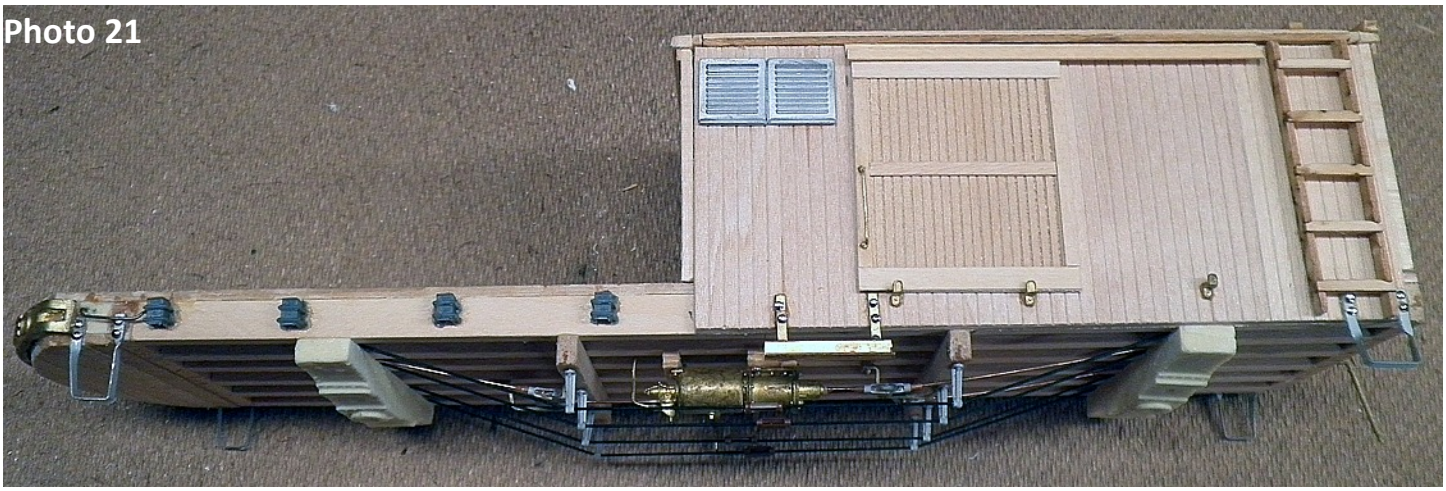


Photo 21

Around the curved trolley end, a cast brass anti-climber (Kemtron) was added using Goo and CA (**Photo 22 next page**). This casting had to be trimmed a bit to match the radius distance and then “adjusted” a bit to the actual radius prior to mounting. On the other end one can that the truss rod ends are present but also now grab irons had been added along with an air hose (PSC) (**Photo 23 next page**).


Photo 22

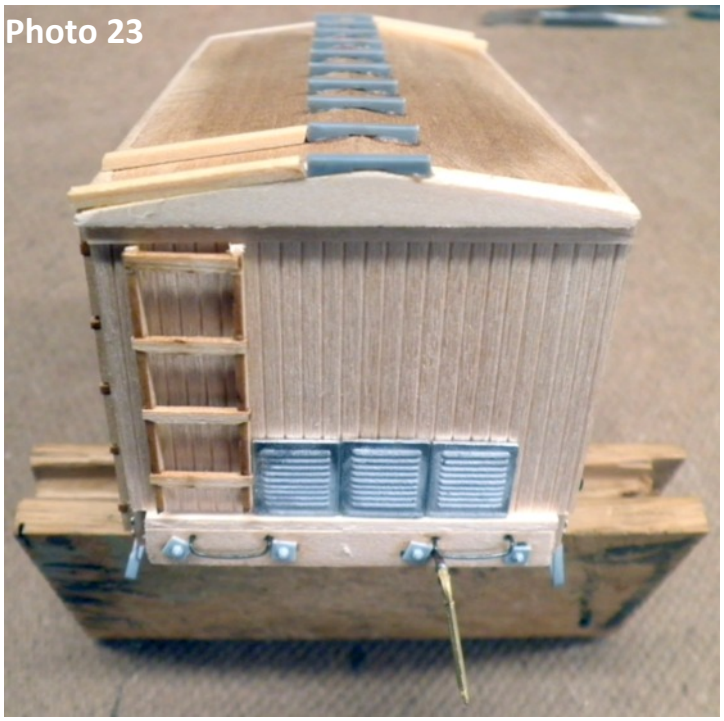


Photo 23

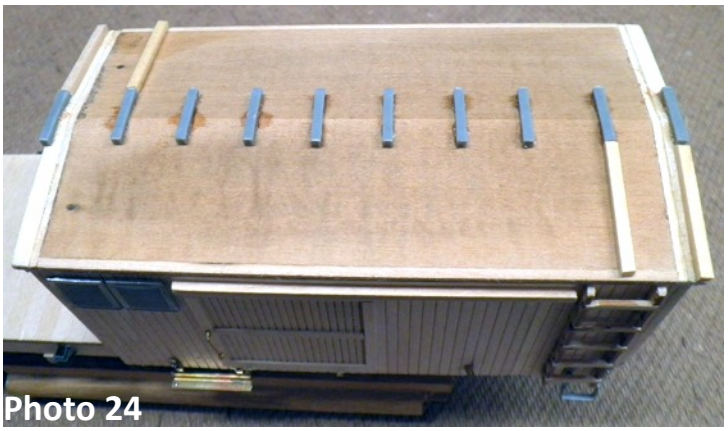


Photo 24

Finishing the roof was attended to next. Grandt Line roof walk supports were added along with supports for the end roof walk platforms (Kappler 3” x 4”) (**Photo 24**). I had some metal fencing material that was in a mislabeled plastic parts bag so real origins are unknown. This was sandwiched between 3” x 4” stakes and 2” x 4” with the stakes set into the pockets on the sides of the car to set spacing and for gluing these all together. I used Goo and CA since the fencing was metal and had some depth that the mix of adhesive would account for doubly (**Photos 25, 26**). The roof was then covered in “canvas” using single ply napkin glued down to the wood in an overlapping pattern using dilute Carpenter’s glue (**Photo 27**).

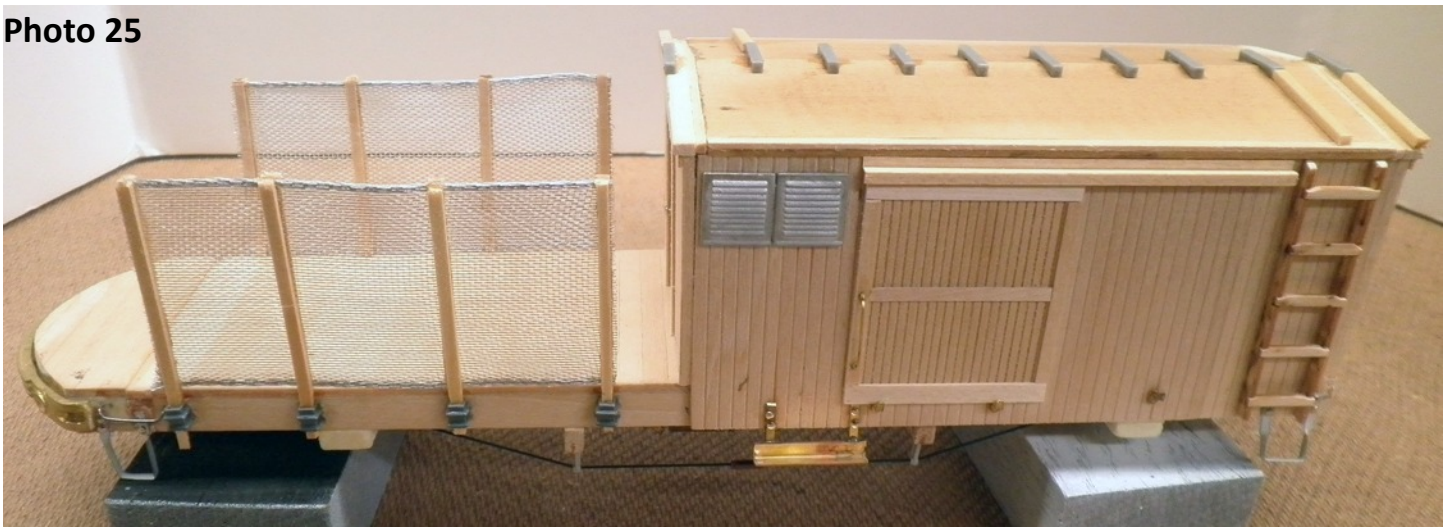


Photo 25

Photo 26

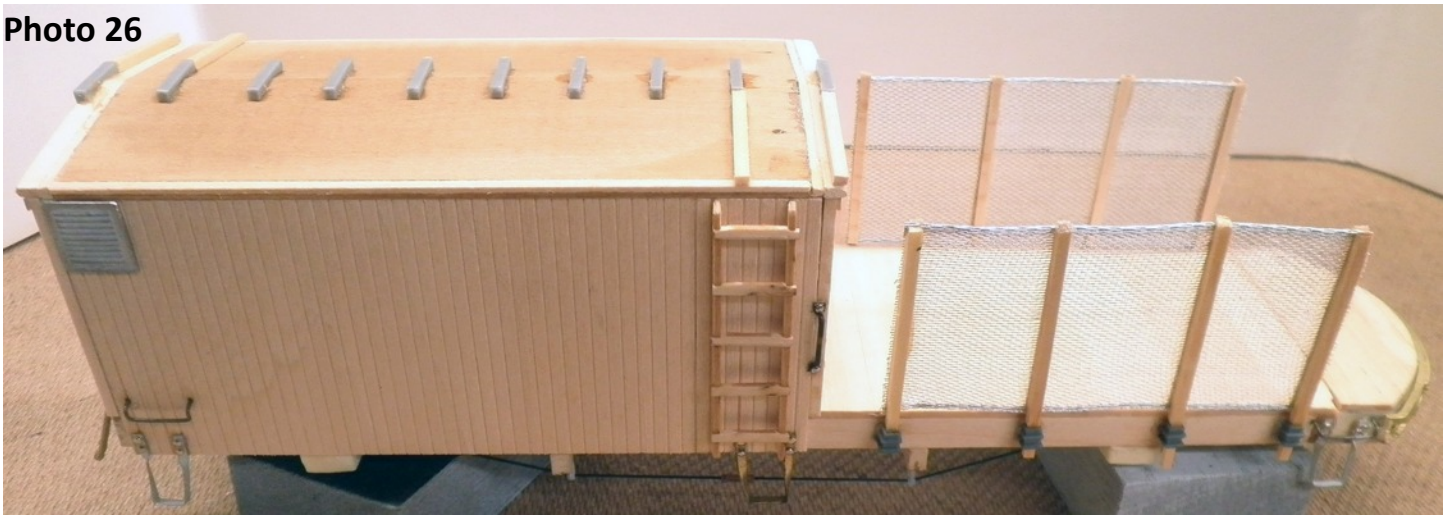


Photo 27

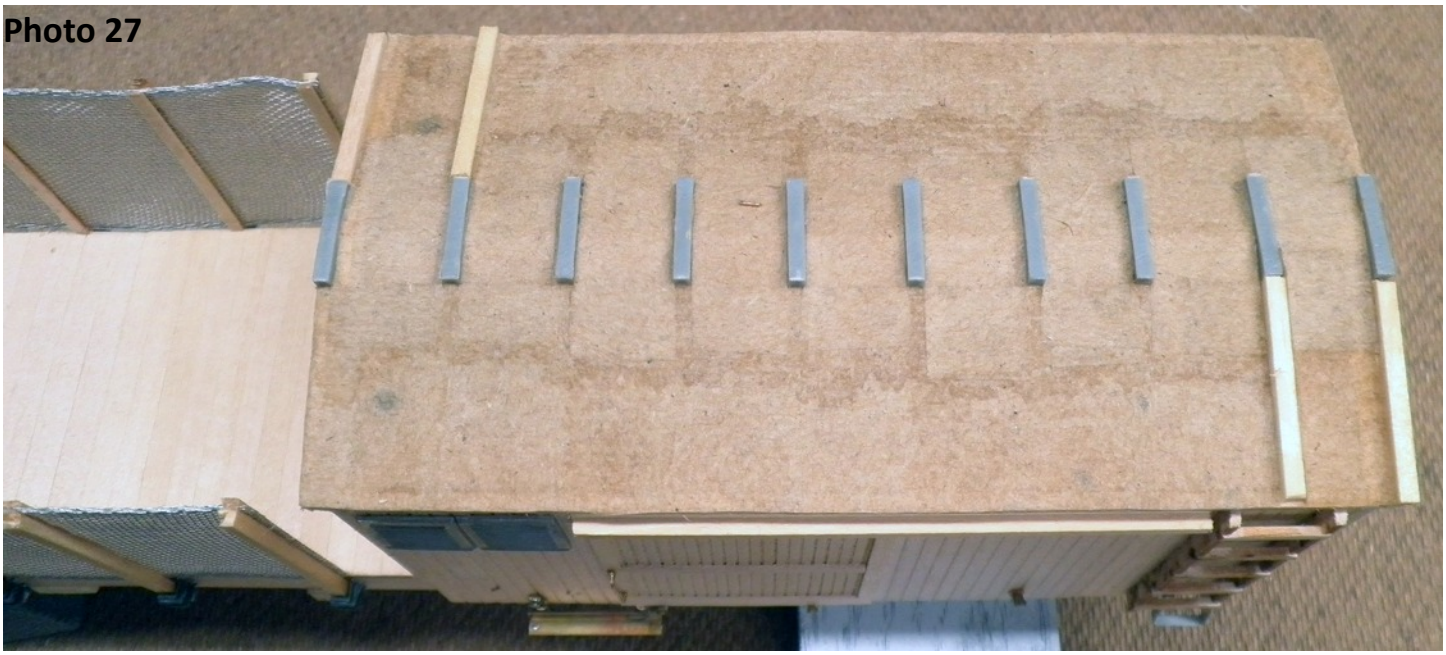


Photo 28

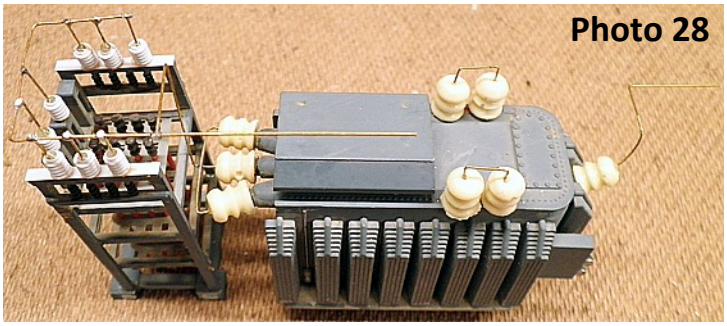
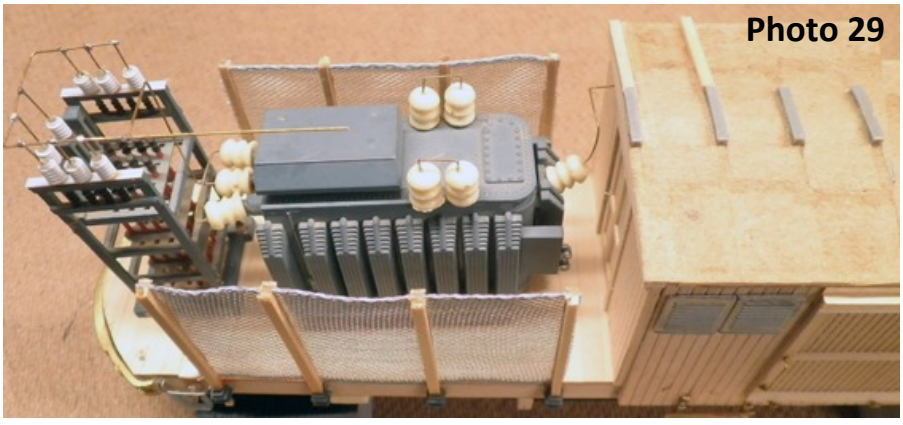


Photo 29



A transformer unit was assembled from parts that I had accrued over the years. Resin cast and ceramic insulators were appended to the two parts. These parts were then tied together using brass wire that was soldered together with a lead that was set to run back into the structure on the car (**Photo 28**). A hole was added to the end wall and prior to painting the car, the transformer assembly was test fitted into place on the deck after threading that lead wire back inside through the wall (**Photo 29**).

Photo 30

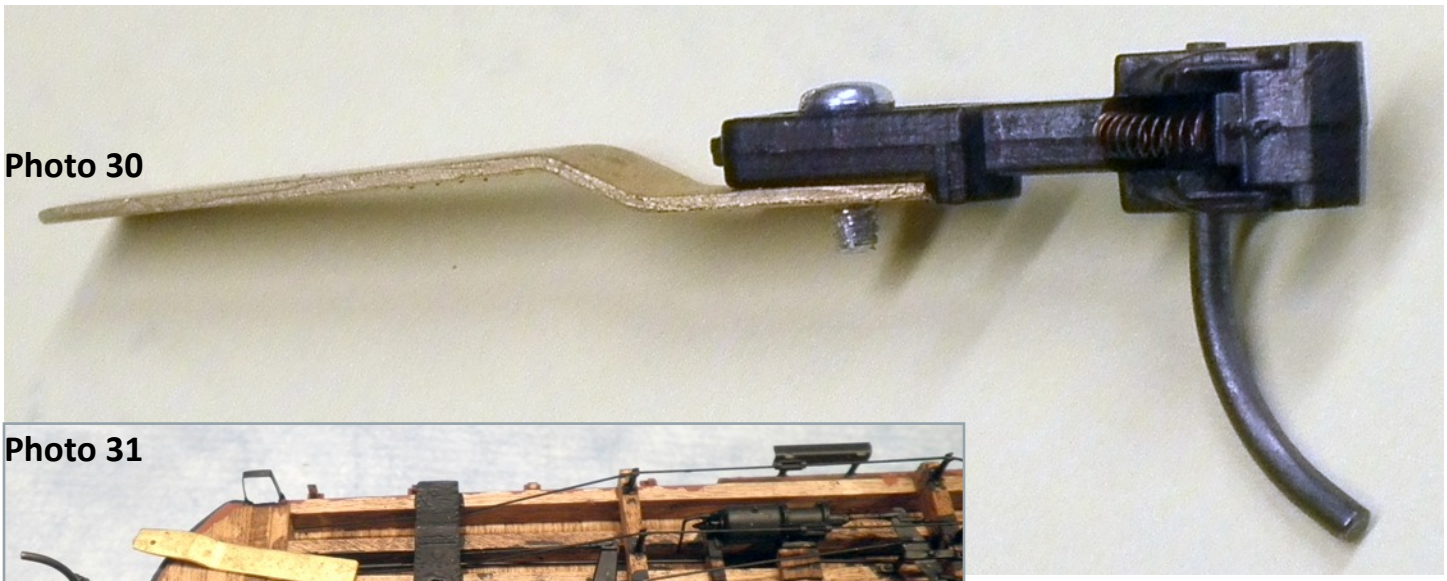


Photo 31

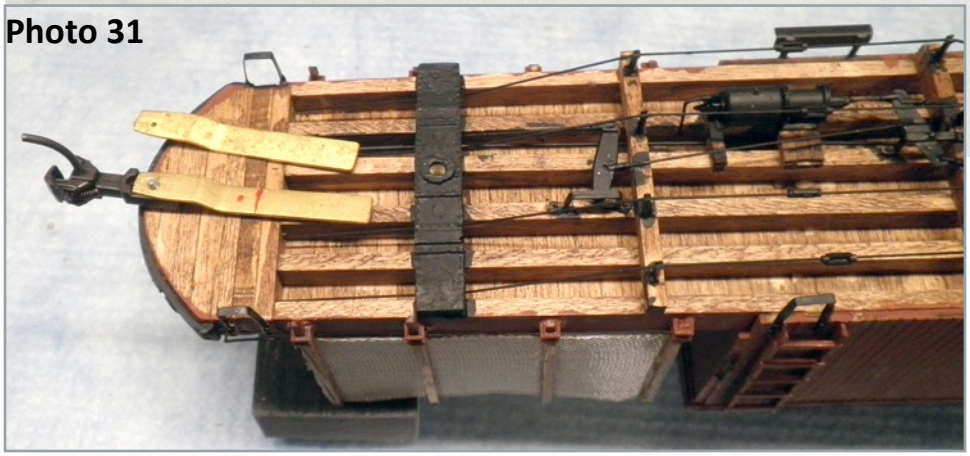


Photo 32

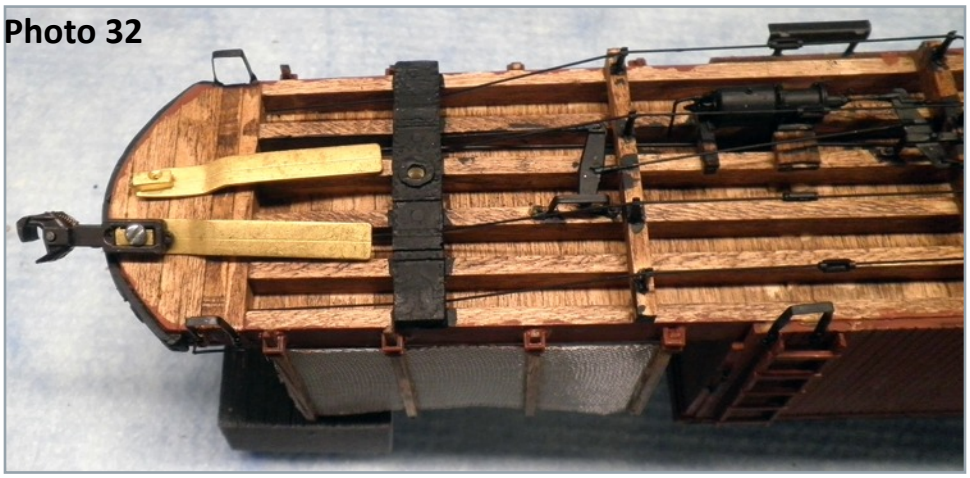


Photo 33

A single radial coupler was fabricated using a brass casting that had to be drilled and tapped to accept a 2-56 screw with a washer to hold a Kadee coupler in place (**Photos 30-32**). This was mounted to the underbody using a self-tapping screw through the underside decking and into the resin casting end (**Photo 33**).


Photo 34


Photo 35


Photo 36


Photo 37

The car body was painted Southern Freight Car Brown (Floquil), the roof was painted Dark Lark Gray (Floquil), the decking was painted CN Gray (Floquil), and the roof walk wood was painted Roof Brown (Floquil). All of the ironwork, underbody details, and trim (grab irons, steps, vents, etc.) was painted Steam Black (Polly Scale) (**Photos 34-37**).

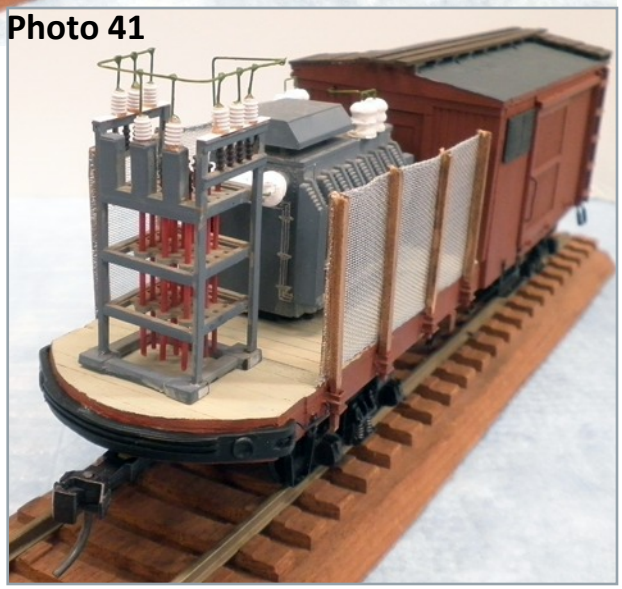
The transformer assembly was returned to its place on the deck and glued in place after clipping the excess wire. A regular Kadee coupler in a coupler box completed the other end of the car and adding archbar trucks completed the car (**Photos 38-42**).


Photo 38

Photo 39

Photo 40

Photo 41



This provided my traction modeling for the CG&W an interface with my CVRR steam line. Having an interest in both aspects of modeling gives one an interesting perspective and opportunity to build unique rolling stock.