

## **Scratch-Building an Interurban Box Trailer Using off-the-Shelf parts and Average Skills**

By Chuck Crouse

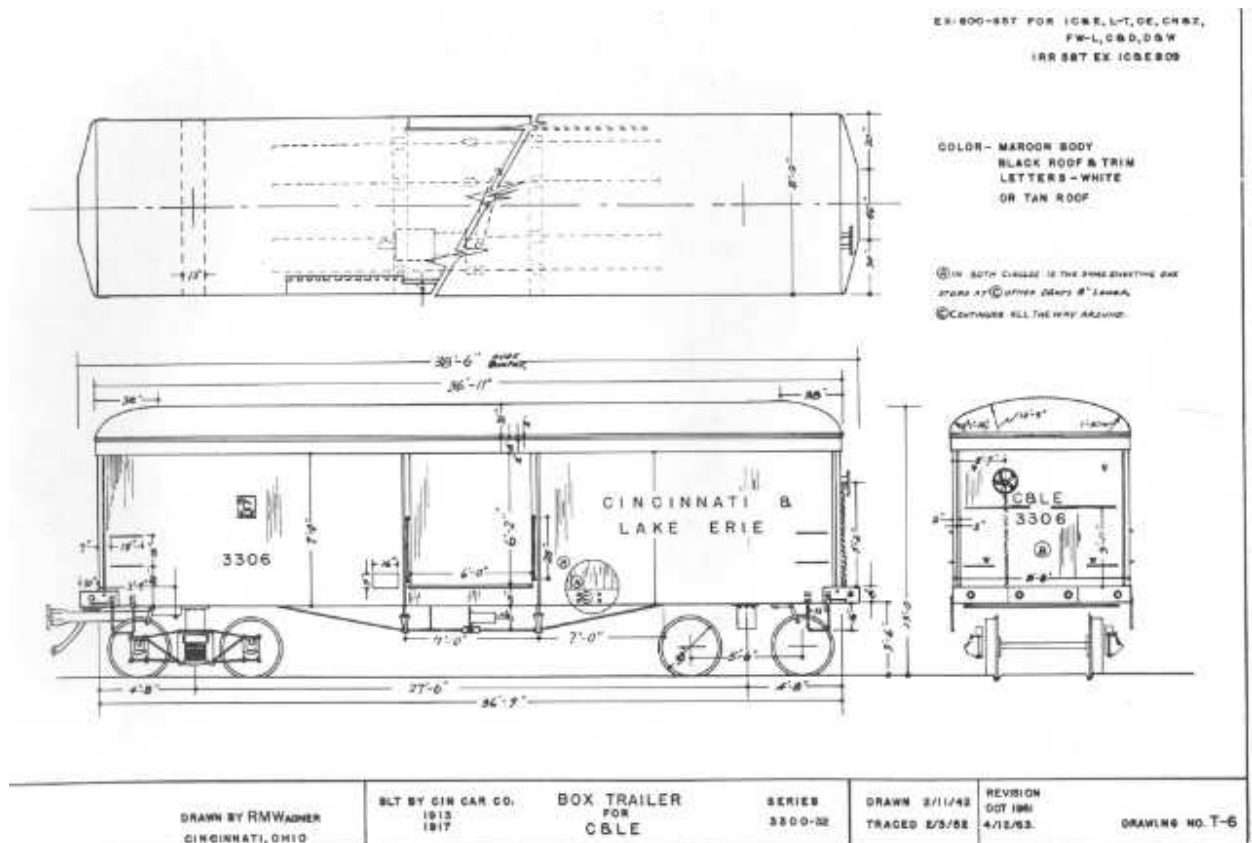
*This is a revised version of an article originally published in “Traction & Models” magazine in December 1983. Revisions address changes in materials sources and my experience in the years since first publication.*



In general, traction modelers have far fewer items to choose from than “railroad” modelers; O scale modelers have a somewhat narrower choice than those in HO; and those wanting freight equipment have it roughest of all. We are just about forced to build rolling stock from scratch. I had done virtually no scratch building since some rather crude HO cars many years ago. So when I decided I wanted something in O scale traction freight, I chose to start with a trailer.

Having grown up in the Midwest, I wanted to follow a Midwestern prototype. I settled on Cincinnati & Lake Erie #3306, a 36’ 9” car originally

built for box trailer use rather than converted from a passenger car as many box trailers were. I chose the car because it is esthetically pleasing, because its length would allow it to negotiate very sharp curves, and because drawings were readily available. One plan, by Mark Hood, appears in Jack Keenan's excellent history of the C&LE, a basic volume for any traction library (out of print but available from sellers of used traction books). Another, by Richard M. Wagner, appears in the *Traction Planbook* published by Carstens, an inexpensive sampler of many traction car styles. It also appeared in the April 1975 issue of *Trolley Talk*, which in its day was an indispensable journal of the traction hobby. That drawing is reproduced here as a tribute to Rich Wagner's conscientious documentation of the original.



*Although this article tells in excruciating detail how to build a model of one particular box trailer, the information herein can be used to build any of many other box trailers. The variables are 1.) length of car body, 2) roof style, 3) placement of doors – inside or outside, 4) placement of grab irons, and 5) end style – round or flat. Research and experimentation will be helpful.*

My first task was to assemble materials. This can take a while, because of multiple sources of supply and rarity of some items. Having limited skills, I decided to use a number of commercially available wood shapes and cast and stamped parts. I worked mostly from the Walthers catalog, but bought some items locally. (The Walthers catalog no longer includes most of what I ordered in 1983. Nor do local hobby shops carry many of the items shown. See the note on sources at the end of this article.) I ordered Northeastern basswood shapes for the floor, roof and sheathing. Trucks were by Walthers (I have since substituted Weaver trucks), radial couplers were by Q-Car, and other parts were made by Kemtron, Wagner and The Back Shop (sources will be different today).

Only a few things were musts:

- 1) The trucks had to be arch bar, a style virtually universal on interurban freight trailers.
- 2) The brake wheel had to have “S”-shaped spokes – the car has so little hardware that the brake wheel was an important detail. The prototype C&LE car had a 15” wheel with five “S”-shaped spokes; I used a Kemtron casting with six spokes.
- 3) The bolsters must allow the car floor to clear the wheels, and must place the bottom of the floor 3’ 6” above the railhead. I used Walthers bolsters 5/16” high. Today, bolsters are offered by Q-Car and Current Line. Both products include tapped holes for easy attachment of trucks.

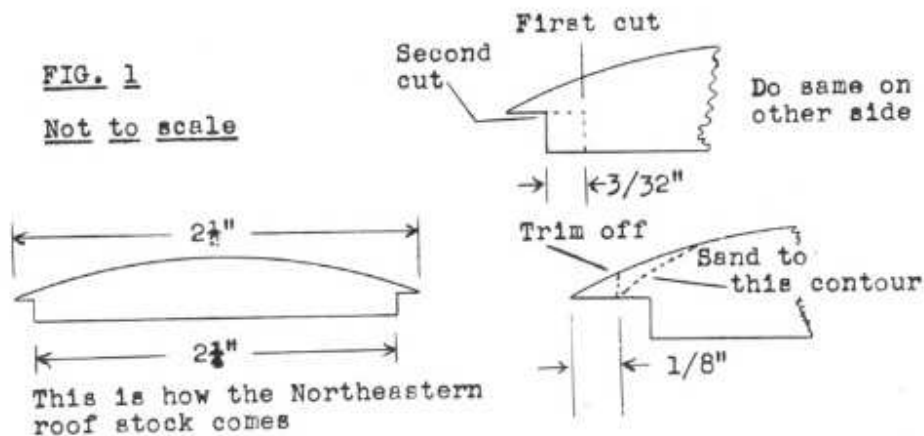
Since rounding up the materials took some time, my first impulse was to plunge right in and build the car quickly. Fortunately, I recalled the poor results I got when I tried that years earlier. I resolved to give this project twenty minutes a night, setting it aside before becoming impatient or frustrated. Instead of taking two weekends, I consumed two months, but I was pleased with the results.

### **Making the roof**

The prototype car was 8’ 9” wide. The O scale model will be 2 3/16” wide. I multiplied the thickness of my side sheathing by two and subtracted it from that figure to get the width of my floor. My Northeastern scribed basswood siding was 1/16” thick, so I needed a

floor  $2 \frac{1}{16}$ " wide. I had purchased Northeastern freight car floor, which is  $2 \frac{3}{8}$ ", so my first job was to trim  $\frac{5}{16}$ " from the stock with the razor saw.

I began by making sure that the roof stock was the right width. I used Northeastern's refrigerator car roof, which has close to the right contour. However, the roof stock is  $2 \frac{1}{2}$ " wide, a scale 10' 0". The prototype had a roof 9' 0" wide, so I had to trim the stock. This involved four operations, two on each side (see Fig. 1). The roof stock has a notch milled into the underside of each side, to accommodate side sheathing. To make the portion of the roof which sticks down between the sides the same width as the floor,  $\frac{3}{32}$ " had to be trimmed from each side. This was fairly easy.



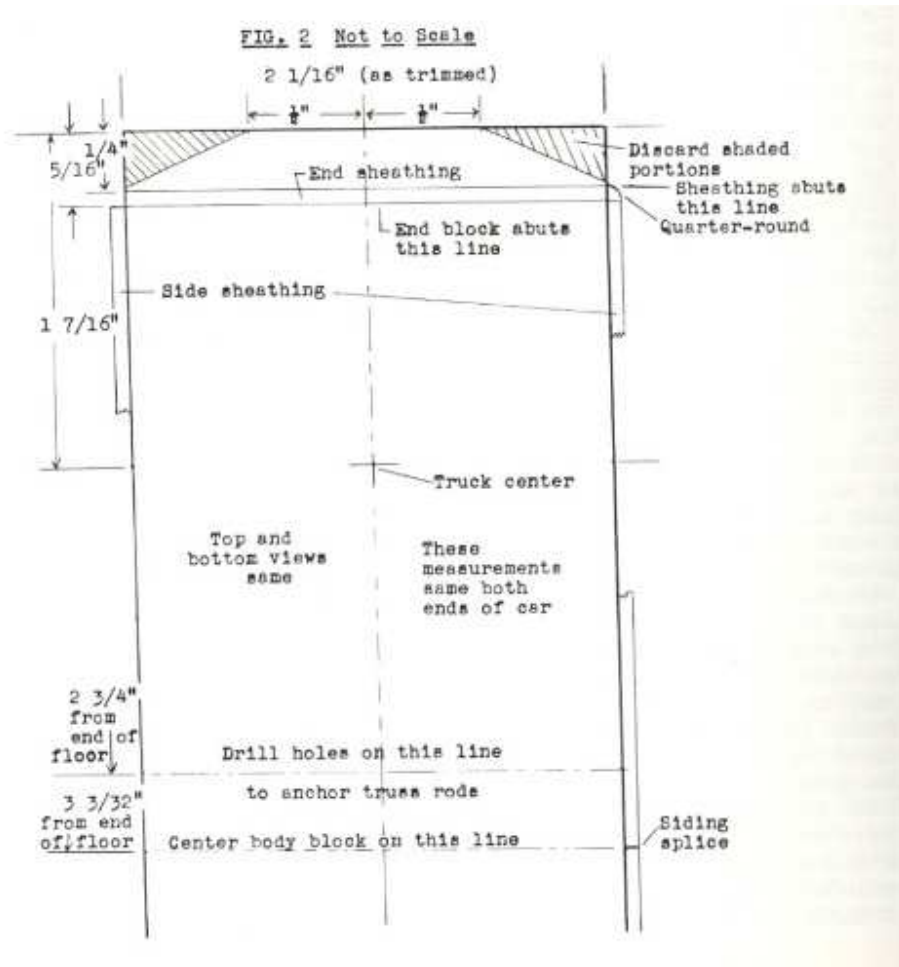
On each side of the roof stock, I drew a pencil line down the underside  $\frac{3}{32}$ " from the edge of the notch. Using a sharp hobby knife, I cut down along this line, just as deep as the notch, which is  $\frac{1}{16}$ ". Then I gently clamped the roof stock in a vise and cut in from the side to intersect the cut just made. A little sanding to smooth things off, and that part of narrowing the roof was done. That still left the top of the roof too wide by  $\frac{1}{8}$ " on each side. Using a razor saw, I made a vertical cut on each side to lop off the excess. This left a flat edge where I needed a curve. So I sanded the side of the roof to a rounded contour. I ended up with a gentle curve over the broad middle of the roof, and a sharper curve where it comes down to meet the sides. While the drawing in the Keenan book shows a single-radius curve, the Rich Wagner drawing shows a sharper curve along

the sides. His notes accompanying its publication in *Trolley Talk* explicitly stated that the double-radius curve was correct. I got a roof very similar to the Wagner drawing, and it was to be the proper width.

### **Trimming to Length**

With roof and floor now the proper width, it was time to trim them to length. While the prototype car body proper was 36' 9" long, the end sills projected twelve inches additional on each end. The buffer plate would be made of brass of negligible thickness, so I cut my floor a scale 38' 9" long, or 9 11/16". Then I took a sharp pencil and drew the longitudinal center lines on top and bottom. Next, I made several marks near each end (Fig. 2). One mark was a line across the top surface of the floor, crosswise 1/4" from each end. This was the outside of the sheathing. Then I drew a second line parallel to the first, 5/16" from each end. This was the inside of the sheathing, but more importantly it was the line against which I would place my end blocks. Now I drew a pencil line across the top of the floor, at right angles to the centerline, 3 3/32" from each end of the floor. The body blocks would be centered over these lines. Flipping the floor over, so that the bottom faced upward, I drew two pencil lines perpendicular to the center line, 2 3/4" from each end. When the time came to mount underbody detail, this is where I would drill holes to anchor the truss rods. In the same manner, I drew lines 4" from each end, as positioning lines for the Wagner queenpost/needle beam castings. Finally, I drew one more crosswise line, at the midpoint of the floor 4 27/32" from either end, to establish the lateral centerline.

Although the end sticks out one foot beyond the end of the car body, it tapers at the corners to allow the car to clear short-radius curves. From the centerline of each end, I measured 1/2" on either side and made marks. Then I drew a diagonal line from each mark to a point on the edge of the floor just short of where the first horizontal line (the outside of the end sheathing) meets the edge. I did this to allow for the width of the side sheathing, so that the taper would end at the outside of the car body. After making these marks at both ends of the floor, I used a razor saw to trim off the four triangular shaped corners.



The roof should be just a tad longer than the car body to provide enough overhang beyond the end sheathing to allow for the cardstock letterboards. Since the car body was 36' 9", or, in O scale, 9 11/16", I trimmed the roof to 37' 0", or 9 3/4". That allowed 1 1/2 scale inches overhang at each end. That seemed a bit generous at first, but wound up being just about right. (A cardinal rule when cutting things to size is to leave a little left over. You can always sand off 1/32" if you need to, but just try putting it back on if you cut too snugly.)

The roof was now squared off at each end. I could have left it that way if I had wished. C&LE had some box trailers built that way, as did many other lines. (See both the Carstens *Traction Planbook* and *Traction Heritage*, Vol.3, No.4, Page 38, for details on the very similar CERA standard box trailer design.) However, since I was building #3306, a rounded roof end was necessary. I used a hobby

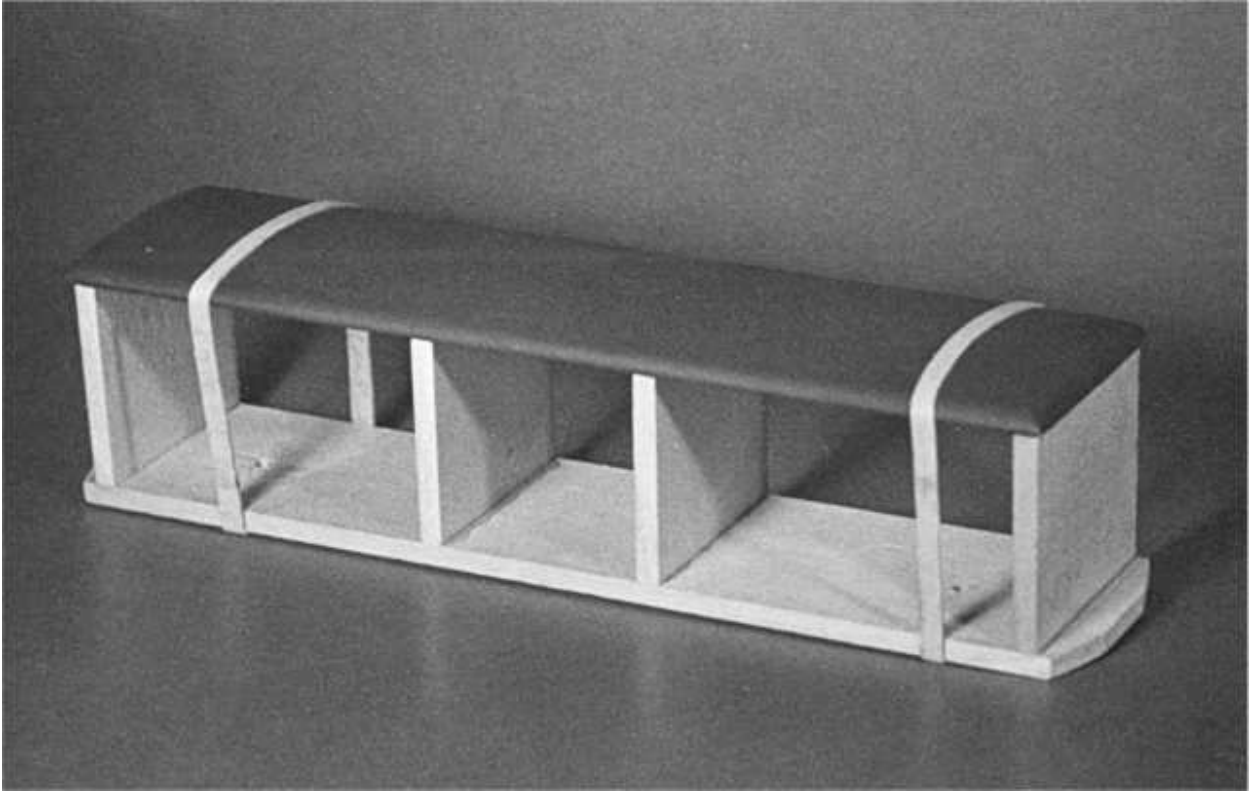
knife and successively finer grades of sandpaper until I had achieved a contour similar to that of the roof sides. I then used a razor saw and hobby knife to create a channel a bit over 1/16" wide along the underside of the roof end to match that along the sides, to accommodate the end sheathing and cardstock letterboard.

*[At this point in the original version of this article, I described how I attached trucks, using kingpins projecting from the underside of the floor. With the passage of time, I have reconsidered, and no longer favor that technique. At the appropriate point in the text, I will describe the extremely simple method which I later adopted. Two of the photos accompanying this revision show the kingpins and the holes drilled to accommodate them. Please disregard the dated material.]*

### **Hanging Hardware**

Having cut the roof and floor to shape, I then cut four identical pieces from what was left of the 3/16" floor stock, 2 1/16" wide and 1 7/8" high, to serve as end and body blocks. I glued the end blocks to the top of the floor, lining them up with the pencil lines referred to earlier, 5/16" from each end. (It's essential that the four blocks be perfectly square on all sides, including the edges. Should you glue an end block in other than a perpendicular position, a lot of work will be required to compensate. Don't ask how I know.)

I then glued the two body blocks to the top of the floor, centering them over the lines drawn 3 3/32" from each end. With the blocks in this position, they would be directly behind the splices in the 3 1/2" wide Northeastern scribed siding, reinforcing the butt joint of the two pieces of siding. After checking all four blocks for perpendicularity, I glued the roof onto the tops of the blocks, making sure that the edges of the blocks lined up with the edges of the downward-projecting portion of the roof. Then I clamped the assembly with some rubber bands and allowed the Ambroid to cure for a couple of days. I got a structure slightly stronger than a brick. After the basic body box was complete, I sanded any joint that did not fit perfectly. Murphy's Law, Section Six, Paragraph B, states that little errors multiply, not cancel each other out.



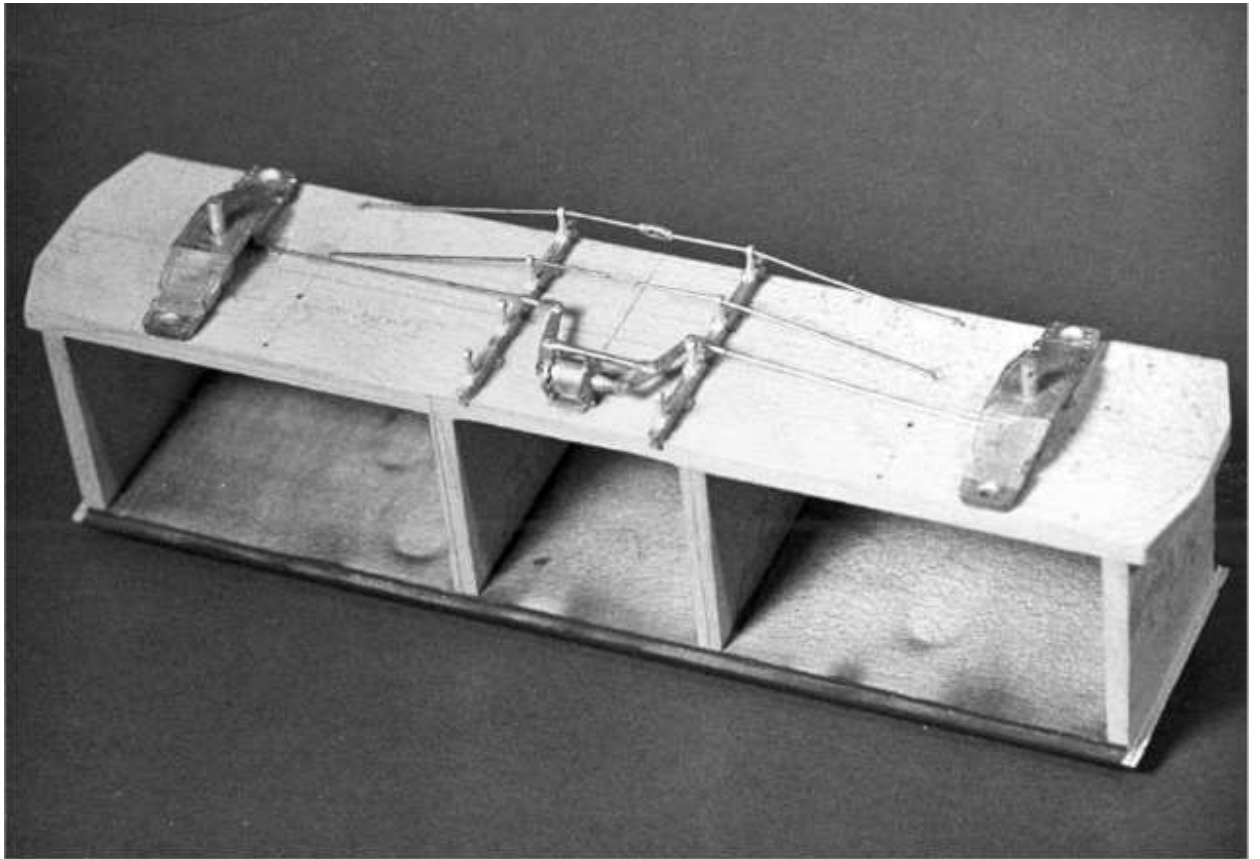
*Rubber bands hold basic car body together while glue dries. The two holes in the floor are for kingpins, which I thought was a good idea at the time.*

This, I decided, would be a good time to mount underbody detail. First, I used a needle file to clean up all castings, eliminating any traces of flash. Then I glued the carbody bolsters in place, centered on points  $1\frac{7}{16}$ " from each end. Next, I glued the Wagner queenpost/needle beam castings over lines previously drawn 4 inches from each end. The brake cylinder and levers came next. I used the Wagner C-81 set, consisting of a brake cylinder casting and a separate casting for the levers.

In cleaning up the castings, I used a small drill in a pin vise to make sure that the swivel receptacles on the long ends of the levers would accept the end of a  $\frac{1}{32}$ " brass rod. Then I used cyanoacrylate super glue to glue the short ends of the brake levers into the slots on either end of the brake cylinder. I then mounted the brake assembly, using a hole drilled into the bottom of the floor for a force fit, plus a good dose of Ambroid. (The next sentence is a doozy: hang on.) The brake assembly was located so that the face of the cylinder from



which the long piston arm projects was directly over the car's crosswise center line, and just inboard of the outside queenpost on the right side of the car, using the end toward which the long piston arm projects as the "front". (See underbody photo. This may seem impossibly complicated, but when you have the car bottom and castings in front of you, it all makes sense. By the way, the end toward which the piston arm points will be referred to as the "B" end later in the construction process.)



*Photo shows underbody under construction. Note placement of truss rods and brake cylinder. Ignore the kingpins protruding from the bolsters, an approach which I later decided against.*

Next, I made and mounted the truss rods and brake rods. All were cut from 1/32" brass rod, widely available in hobby shops. The brake rod is in two pieces, each a bit over 2 1/2" long; the length isn't critical. I used CA (super glue) to glue one end of each rod into the

receptacles on the long ends of the brake levers, and Ambroid to glue the other end of each rod to the car floor at the bolster. In truth, brake rods on the prototype went to the trucks, not to the bolsters. In retrospect, had I been striving for greater accuracy, I would have had the ends of the brake rods go to the edge of the carbody bolster, as close as possible to the trucks, and not to the floor.

To make the truss rods, I cut eight pieces of 1/32" brass rod, each about three inches long. Using a drill bit of the same diameter, I drilled eight holes in the bottom of the car floor, four on each of the previously-drawn pencil lines 2 3/4" from each end. Each hole was lined up with a corresponding queenpost. (See photo of car bottom.) I used needle-nosed pliers to make two bends in each truss rod: a gentle bend 3/4" from one end and a bend of nearly 90 degrees about 3/16" from the other. Both bends were in the same plane. I experimented until I had a master, then bent the rest to match that one. The idea was to have two half-rods almost meet in the middle, and to be joined by a turnbuckle casting and some CA cement.

Before applying the CA, I made sure that the slot on each turnbuckle casting, which allowed it to fit over the rod, was turned inward, with the small hole on the opposite side of the casting facing outward, toward the viewer. I found it best to first bend the rod at both points, then slide the straight end through the hole in the queenpost, then rotate the rod and glue the "hook" into the hole in the floor. Again, this is easier than it may sound, since it's all common-sense stuff.



*Underbody shot of the car, taken 29 years after construction. The trucks are still mounted via kingpins, though subsequent cars did not use this technique. The dark grey rectangles are lead weights.*

### **Applying the Sheathing**

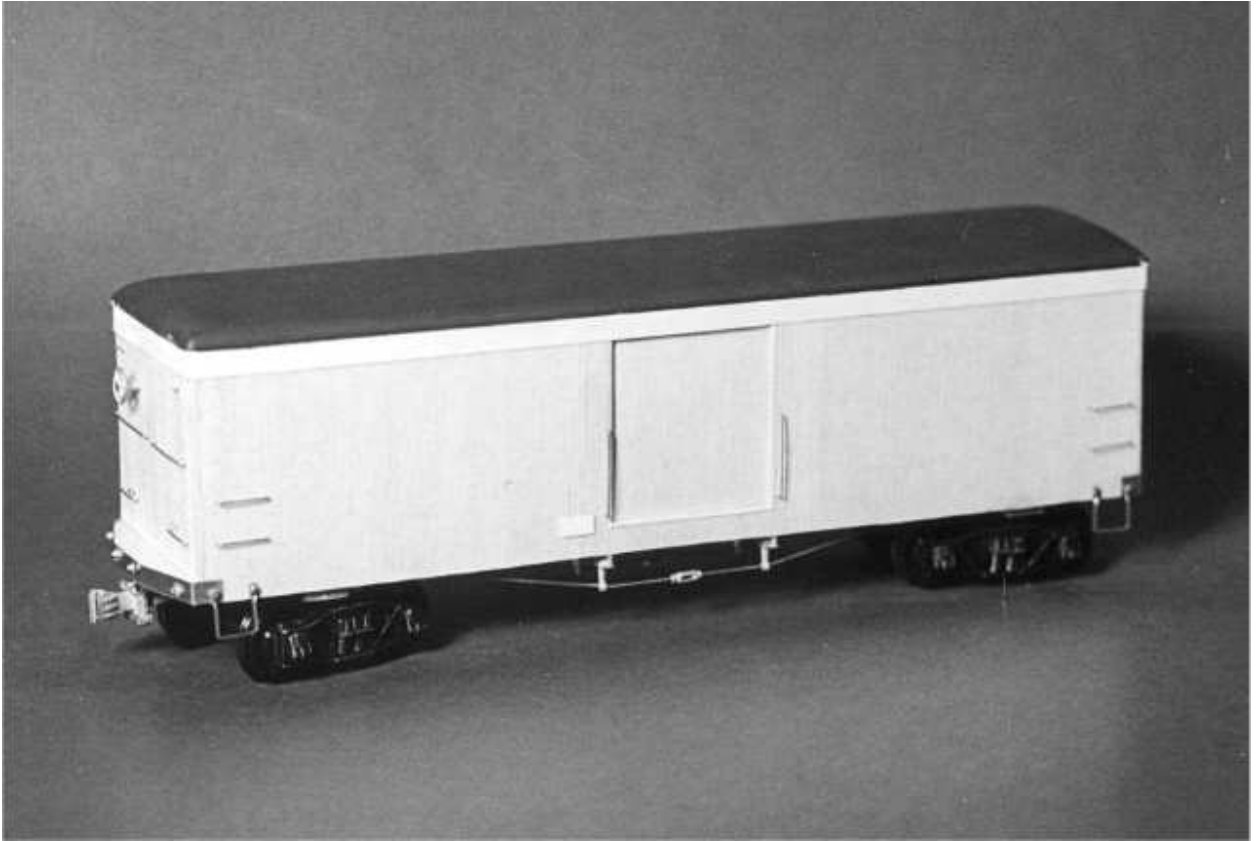
It was time to make that box look like a box trailer. I did the easy thing first, cutting two ends from the scribed siding, each a hair over  $2 \frac{1}{16}$ " wide and  $1 \frac{15}{16}$ " high. Using trial and error, I sanded each one to fit snugly, then glued it into place with Ambroid. As I noted earlier, the Northeastern scribed siding is  $3 \frac{1}{2}$ " inches wide, with the scribing lengthwise. Thus the car sides must be pieced together. Each side requires four pieces of siding: the door panel, the door itself and the two pieces covering the space between the door panels and the ends of the car. The door panel takes some work. I cut a piece of scribed siding measuring a full  $3 \frac{1}{2}$ " wide and a shade over  $2 \frac{1}{8}$ " high. In that piece I cut a door opening measuring  $1 \frac{5}{8}$ " wide by  $1 \frac{11}{16}$ " high. Laterally, the door opening should be centered on the piece of siding; vertically, there should be  $\frac{1}{4}$ " below the door opening and  $\frac{3}{16}$ " above it.

By first drilling small holes in each corner of the door opening, and using a very sharp knife with a straightedge for guidance, I managed not to split the wood. I made numerous passes using gentle pressure rather than bearing down on the knife. Had I split the wood, I could have started over with another piece of siding, or I could have finished the door opening and then glued the panel back together. Once the door opening was cut and sanded smooth, I cut two pieces of 1/16" square stripwood about 1 3/4" long. Sanding one corner to a rounded contour gave me a piece of quarter-round stock. I trimmed and sanded each to fit the two sides of the door opening, and glued them into place. I wiped up any excess Ambroid with my fingertip. Then I repeated the process for the door panel to be used on the other side of the car.

Each door is simply a piece of scribed siding slightly larger than the cutout, glued into place on the inside. I trimmed each to make sure that it didn't stick down so far as to foul the car floor or up so far as to run into the roof. Once the quarter-round and the doors were in place, I glued the door panels into place on the car body. The fit against the roof did not have to be perfect, since the letterboard would cover it. And the bottom edge of the siding didn't have to be perfect, since it would be sanded later. The one crucial element was that the scribing and edges of the panel had to be absolutely perpendicular to the floor. And the edges of the panel had to end at a scribed line, rather than partway across a board. The goal was to disguise the splices and make them look like scribed lines. And the edges of the door panels had to fall at the approximate midpoint of the body blocks, which reinforced all splices.

Once the door panels were glued to the car body, it was a fairly simple matter to cut four more pieces of scribed siding, each just over 2 1/8" high, and to trim and sand them to fit. Again, I made sure that the edge of each panel was a scribed line. Some test-fitting and fine sanding was called for. I trimmed the pieces to end flush with the outside of the end blocks. This left gaps 1/16" square at all four corners. I filled those gaps with more pieces of quarter-round sanded down from 1/16" square stripwood. Despite my efforts, there were some small gaps left when I finished with the corners. I filled the gaps with Squadron green putty, allowed it to dry overnight, and sanded it smooth. Then I sanded the bottom edge of all the siding to

get a smooth, even line that was just a tiny bit below the bottom of the car floor.



### **Trim**

For the letterboard, I used cardstock. Using a steel straightedge and a new blade in the hobby knife, I cut strips 3/16" wide from a file folder, and glued them to the tops of the sides and ends, wrapping around the corners and joining on the ends. I used the hobby knife and a dab of green putty, sanded smooth after the putty had dried, to smooth off the joints. In gluing the letterboard in place, I made sure to snug it up against the roof. I failed to then give the cardstock a couple of coats of sealer. The result is that the finished and painted model has a slightly hairy letterboard, which a charitable viewer may interpret as weathering.

I considered using cardstock for the end sill buffer plates, but decided that brass would do a better job of warding off the bumps that

the model would likely suffer in operation. From a sheet of hobbyshop-standard .005"-thick brass, I cut two strips 3/16" wide by about 4" long. I used the same hobby knife that I'd used in cutting the cardstock, and threw away the blade when I was done. (A sharp blade being essential in making clean cuts, it's advisable to replace blades frequently. A project such as this should be good for as many as a dozen blades.) The prototype car had four big bolts through the buffer plate. I used nut/bolt/washer castings from Kemtron, which have brass shanks extending backward.

With the brass strip cushioned against a piece of scrap wood, I scribed it at the four points at which it was supposed to be bent (taking my measurements from the model, not the plan). Then I used a sharp-pointed instrument (to wit: a dime-store compass) to mark the locations of the n/b/w castings. I found that "eyeballing" the locations was quite satisfactory. I then selected a drill bit sufficient to clear the shanks of the castings and drilled the eight holes – four per end – using a pin vise. Then, with a smaller bit, I drilled four more holes on the short portions of each buffer plate which wraps around onto the side to mount one leg of each of the U-shaped stirrup steps. Using some steel wool and then a needle file, I cleaned up the areas around the holes and edges of the brass strips. I had deliberately cut the strips too long, to give me something to hold onto. Now, using the hobby knife, I trimmed off the excess at each end of each strip, leaving just enough of the wraparound portion to cover the quarter-round and the first three sheathing boards.

With long-nosed pliers, I bent the strips at the four scribed points per strip, making sure that each bend was just a tiny bit more than necessary. This was so that, once on the car, the strip would grip the car like jaws, instead of trying to spring outward. I glued the strips to the floor ends with Ambroid. (Duco or 5-minute epoxy would also have been suitable.) After the glue dried, I drilled through the eight larger holes into the wooden floor, to clear the n/b/w casting shanks, smeared some Ambroid on the shanks and pressed them into the holes. I used the tip of my finger to wipe away any extra glue.

The grab irons are easily made from .02" brass rod, snipped to length with side-cutters and bent to shape with needle-nose pliers. I plotted the positions and drilled the holes first, then made the grab

irons to size. I would start by bending one leg, making it about  $3/8$ " long, measuring the length of the grab iron, then bending to other leg and snipping it off at about  $3/8$ ". I found that I made very few mistakes if I allowed for the thickness of the rod when I made the bend. If, on the other hand, I marked the desired length and placed the jaw of the pliers precisely at that point, I would usually get a grab iron that was a tiny bit too short. Regardless, I didn't waste very much brass rod, and some grab irons that were only a hair off could be re-used elsewhere. If I found a grab iron hard to insert, I dressed the ends with a needle file.

There are twelve short grab irons: two on each end and four on each side (see Wagner drawing). Each is a scale  $1' 9"$  long, or  $7/16$ " in O scale. There are eight long grab irons: two on each end and two at each door. They are  $3' 3"$  long, or  $13/16$ " in O scale. The grabs flanking the doors are placed about one-half board over from the quarter-round, and start  $3/32$ " up from the bottom of the door opening. The short grabs on the sides near each end start two boards from the quarter-rounds. The lower of each pair is  $1/2$ " from the bottom of each side; the upper is  $3/8$ " above that.

On the ends of the car, the short grabs start two boards in from the quarter-round and are  $5/16$ " above the top of the floor. The long grab irons on each end also start two boards in from the quarter-round and are one inch above the top of the floor. All grabs are mostly held in place by friction, so drill for a snug fit; I think I used a #72 bit. You may wish to put a little glue on the legs when mounting them. The paint also helps hold them tight.



*Photo shows the end of the car without the brakewheel. After 29 years, the car shows its age, as did the prototype.*

The next step is optional. Both plans show four small V-shaped things on each end. These, though neither plan says so, are flag/lantern brackets. I was unable to locate any such item in the Walthers catalog. Nor do I recall seeing them in the Q-Car or Current Lines catalogs of more recent years. I made do with some lost wax brass steam locomotive handrail brackets from The Back Shop. Though they don't look very much like the real thing, they do look like brackets of some kind, and are about the right size. I held each in the jaws of some needle-nose pliers while I filed away a cast ring around the shank of each which would prevent them from sitting close to the sheathing. It was a little tedious, but I sure felt like a resourceful modeler! Upper brackets were mounted 18 scale inches below the bottom edge of the roof and 18 scale inches in from the corner. The lower brackets went three scale inches above the short grab irons and six scale inches from the inner ends of the grabs.



Next came the brake wheel, and again compromise was necessary. If you look at enough photos of interurban box trailers, you will see that brake wheels often sat out about nine inches from the end on a squarish open platform. No such thing is available to the builder of 1:48 box trailers. You could perhaps create one out of cleverly-bent brass wire. If so, like Gunga Din, you're a better man than I. I chose to mount my brake wheel out nine inches on a neat little cylindrical housing which again is easier to make than describe. I took a round toothpick, cut a piece of the non-tapered middle about an inch long and proceeded to hollow it out, using a pin vise and a #72-or-so bit. My wife, observing this, refrained from questioning my sanity, but did chortle some.

Once I had ¼" or so of the toothpick hollowed out, I turned it on its side and, using a slightly larger bit, drilled a hole in from the side to intersect the hollow core. I then sawed off nine scale inches worth of hollowed toothpick, including the hole in its side, and stuck a common pin through the brake wheel, through the hollow bit of toothpick and through a #76-or-so hole in the "B" end of the car, said hole being 2' 9" from the corner and 2' 6" down from the bottom of the roof. Just before the glue set, I rotated the little wooden cylinder so that the hole in its side faced downward. Later, one end of the brake chain would be glued into that hole. Before leaving the matter of brakes, I put a larger bit, about #46, in the pin vise and drilled a hole through the floor directly below the brake wheel, 1/16" out from the end sheathing. (See Wagner drawing.) That was for the other end of the brake chain.

As a hybrid of materials, the car wouldn't be complete until I could add to the wood, brass and cardstock at least a little styrene. So I used that for the thresholds of the doors and for the waybill tack boards next to the doors. The tack boards, one each side, were simply 5/16" long snippets from a strip of Evergreen O scale 1 x 8 white styrene. For the thresholds, I took a piece of the 1 x 8 strip 1 5/8" long, slit it down the middle, then filed the ends to notch around the quarter-round door frames and stick out just a little. No special adhesive was needed; Ambroid worked just fine. I had put off the stirrup steps until now for fear of damaging them, since they project downward. The steps came with pre-punched holes. I decided to use common pins to mount them. I had already drilled one small hole in

the part of each buffer plate that extends around the corner. Laying the step in place so that one mounting hole lined up with that hole, I used a sharp pencil to mark the location of the second hole, and used a #76-ish bit to drill it. You may be noticing that one strap of the step will be mounted directly on the sheathing, and the other on the brass buffer plate, slightly farther out, and that the step will thus be slightly askew.

Yup. That's the way it was done. (You may also notice, on studying the Wagner drawing, that there were not one but two holes in each strap. The steps I bought had one hole. So sue me.) Do this on all four corners. Then be somewhat generous with the Ambroid as you mount the steps using 3/8" long stubs of straight pins. It may seem like a pretty shaky arrangement, but as long as the hole for the pin is a reasonably snug friction fit and the Ambroid gets worked around the pin shank and both sides of each step strap, the result will be fairly solid. In 28+ years, I have had to re-glue one step, once.

## **Couplers**

The last major step in assembling the car is attaching the couplers. The couplers I originally installed were dummies, which swiveled on a semi-circular brass radius bar. I used 0 – 3/8 brass wood screws to attach them. The center of the radius bar's arc should be right up against the edge of the buffer plate, but provide room for the coupler to swing freely, not binding against the floor. If there is binding, it will be the lip of white metal which rides above the radius arm, against the wooden floor. You may wish to file a little of that white metal lip, but be careful not to leave the lip so thin that it breaks off. Or you may wish to use a hobby knife to carve a little wood from the bottom of the floor just behind the buffer plate. I don't suggest using glue to attach the coupler assembly to the floor, because that would make it difficult to change couplers in the future.

Dummy couplers have their limitations. You may wish to install operating couplers instead. A few years ago, I replaced my dummies and their radius bars with Current Line M-400 radius bars with pockets for Kadee couplers. I then bought Kadee #801 O scale couplers cast in Brown (Boxcar Red) plastic, cut off part of the shank

as directed in the Current Line instructions, and mounted the Kadec coupler head in the pocket provided in the radius bar. Be sure to drill the small hole through the assembly and insert the tiny pin as instructed, because without it, your coupler heads will pull out of their pockets under load. A few drops of Duco or some other adhesive suitable for dissimilar materials will keep the coupler head from drooping. Before mounting this assembly on your car, you'll need to bend the curved metal actuating lever (which looks like a brake hose). As it comes, it will probably hang low enough to strike rail heads and grade crossings. I used two needle-nosed pliers, one in each hand, to bend the end of the lever upward about 1/16" from its original position. This requires some force, but also some care, to avoid breaking it. Before operating your car, make sure that the coupler height meets NMRA standards.

### **Painting and Lettering**

Somewhere along the way, you have no doubt heard it said that bare wood should be given a coat of sealer before it is painted. Now is the time to do that to the roof. You will note from the photos that I even painted the roof early on. That was to provide a bit of a tough shell, to protect the bare wood from scratches and scrapes. I also brushed sanding sealer onto the ends and door panels before I realized that it was not only closing up the grain, it was filling in the scribed lines. So I did not seal the remaining panels. In time, I came to feel that the unsealed part looks better. I have to admit that the ends, which were sealed, look like an old, grubby trailer that's been repainted several times. If you're going for a weathered car, you may want to use the sealer, if only to partially fill some of your scribing.

Authoritative treatises on painting models may be found elsewhere. Suffice it that I carefully brush-painted the roof flat black, masked it carefully with standard hardware store masking tape, airbrushed the body Tuscan red, then brush-painted the underbody, buffer plates and stirrup steps flat black.

You have three choices for lettering the car. If you are a professional calligrapher, you may want to hand-letter it. Most mere mortals would choose decals, about the use of which much has been written. I picked the third and, I think, the best way: dry transfers.

At the time I built this car, W. E. Stinger of Narberth, PA, offered a good selection of C&LE dry transfers. These are no longer on the market. Some of those transfers, purchased but unused, may be in the hands of modelers or dealers. A free ad in the East Penn Traction Club newsletter may be helpful. ([www.eastpenn.org](http://www.eastpenn.org)) If you are determined to use dry transfers, and cannot locate any specifically produced for the C&LE, you may wish to purchase some alphabet and number sets from Clover House. The font Octic closely resembles that used by the prototype. As for the C&LE herald, with the winged “C”, you’re on your own.

All that remained was to cut a 1 3/8” length of chain, paint it black, and glue one end in the brake wheel housing and the other end in the hole drilled in the floor below. The chain hangs inside the long grab iron. Then I gave the car a protective spray of Dullcote, attached the trucks to the pre-tapped bolsters with 2-56 machine screws, and sat back and admired the beastie. Now about that big shipment due out of Columbus tonight...

### **TOOLS NEEDED**

Ruler  
Scale rule  
Razor saw  
X-acto knife (or similar) and spare blades  
Small bench vise (optional)  
Needle nose pliers  
Wire (or rail) cutting pliers  
Small and very small slotted screwdrivers  
Needle files  
Pin vise and assorted bits in 61 – 80 range  
Sharp pencil  
Assorted sandpaper and sanding sticks  
Steel wool (optional)  
Glue, such as Ambroid  
Cyanoacrylate cement (super glue)  
Paintbrushes, artists’, preferably #2, #00  
Airbrush (optional)

### **Bill of Materials**

1 3/16" basswood freight floor or stock sheet: Northeastern, Micro-Mark, Midwest (3" x 24" stock only)  
1 refrigerator roof: Northeastern, Micro-Mark  
1 1/16" thick basswood scribed sheathing, 1/16" spacing: Northeastern, Midwest, Micro-Mark  
1 pair 5/16" bolsters, drilled and tapped for 2-56 screw  
Two 2-56 machine screws  
Four twisted and punched strap steps (or fabricate from 1/16" flat brass wire)  
1 O scale chain  
Four 0 – 3/8 brass wood screws  
1 pair Weaver arch bar trucks (scale flanges)  
1 set Current Line C-411 queenposts/turnbuckles  
1 set Current Line C-81 brake cylinder levers  
1 pack Kemtron #203 large nut/bolt/washer castings  
1 pack Kemtron #688 brass brake wheels  
1 pack Back Shop #HP-102 handrail posts (or flag/lantern brackets as available – see text)  
1 pair Q-car couplers & radius bars OR  
1 pair Current Line #M400 radius bars with Kadee coupler pockets  
1 pair Kadee #801 couplers, Freight Car Red preferred  
1 pack K&S #250 .005 brass sheet or equivalent  
1 K&S .020" brass rod  
1 K&S 1/32" brass rod  
1 pack Evergreen #1108 strip styrene or equivalent  
1 file folder  
1 round toothpick  
5 common pins  
Floquil or equivalent Flat Black paint  
Floquil or equivalent Tuscan Red paint  
NOTE: For best results, use both colors of paint from the same manufacturer  
1 set Stinger Standard C&LE dry transfers OR  
1 set Clover House Octic 9" white letters/numerals dry transfers  
Testor's #1260 Dullcote spray

