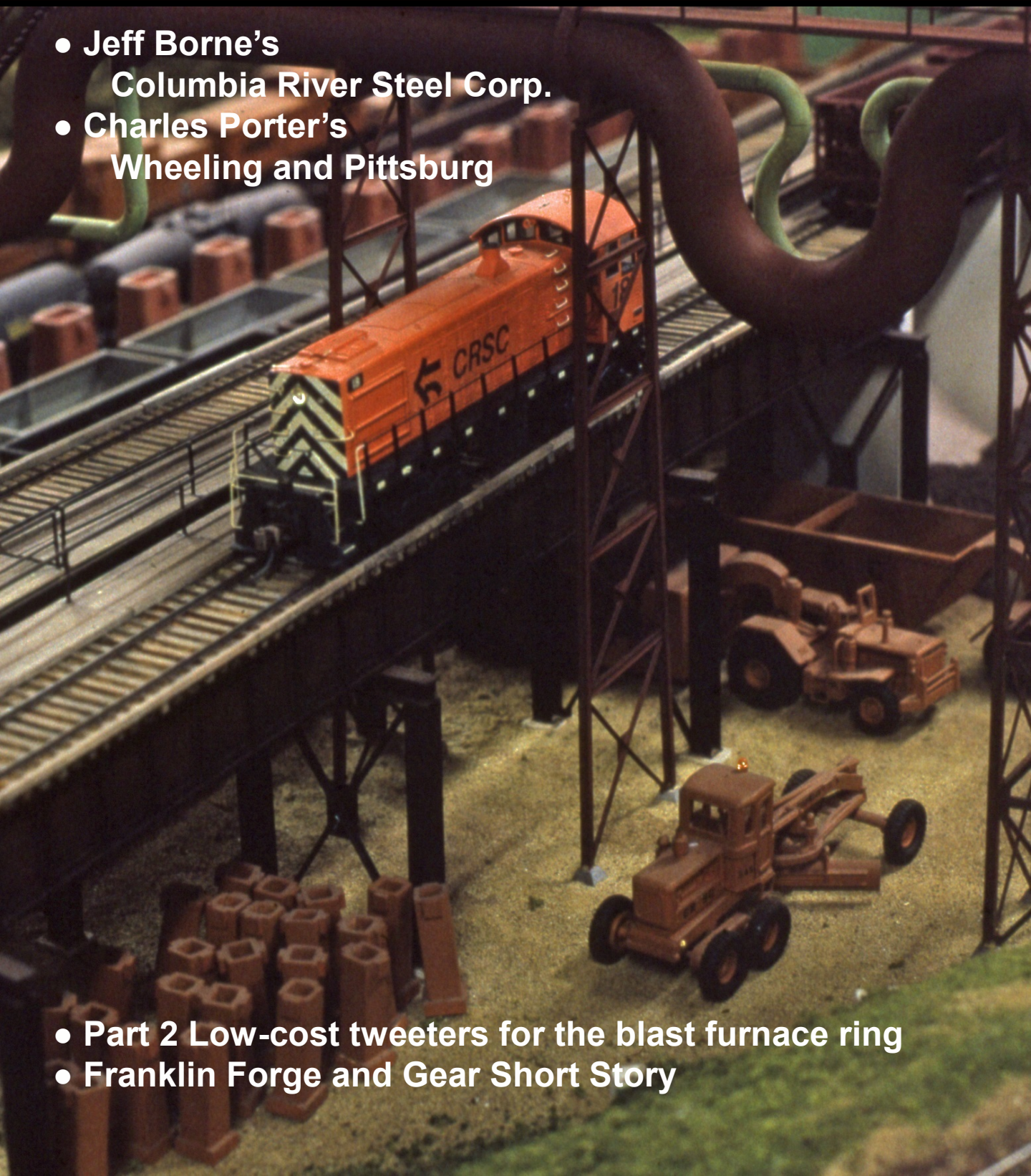
The Mill is a publication of the Steel Mill Modeling and Steel Mill Pictorial groups

THE MILL

Oct 2018
Vol 2 Num 4



- Jeff Borne's
  Columbia River Steel Corp.
- Charles Porter's
  Wheeling and Pittsburg

- Part 2 Low-cost tweeters for the blast furnace ring
- Franklin Forge and Gear Short Story

The Mill

The Mill is a publication of the Steel Mill Modeling and Steel Mill Pictorial groups and is sent out to the readers quarterly. The Mill is only available in PDF format and is free to subscribe.

History

The Steel Mill Modeling group was founded on October 21, 2014,
July 1st, 2018: 1,377 members
https://www.facebook.com/groups/708840849171343/

The Steel Mill Pictorial group was founded July 14, 2017,
July 1st, 2018: 391 members
https://www.facebook.com/groups/1561038727264008/

To Sign Up

To sign up to receive the newsletter, send an email to Don Dunn at don_csx@hotmail.com .

The Purpose

This newsletter is to recognize the members of the steel mill community that would like to share their modeling ideas, on how-to builds of steel mills and equipment and the members who like to share their knowledge of the steel industry in general. This also includes industries that support the steel industry including coal, lime store, slag, coke, etc.

Thank You

I like to thank the members of the Steel Mill Modeling Group, Steel Mill Pictorial Group and the Yahoo Steel Mill Group for what you all have done to make this newsletter possible. Thank you all who have contributed to passed and future issues of The Mill Newsletter.

As Always Take Care, Stay Safe, Happy Modeling and God Bless you all.

Don Dunn
Editor

Cover Photo

Alco S-2 #12 on the highline of Jeff Borne's CRSC layout

In this issue

Submission information

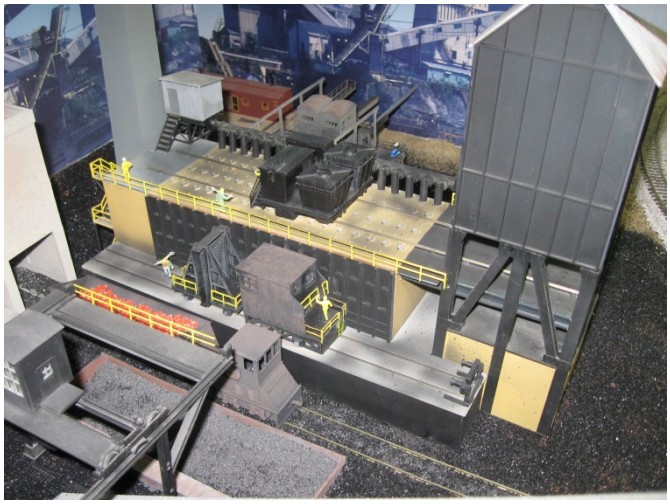
Any one who would like to submit pictures, articles, club news, upcoming shows or evens to be placed in future issues of The Mill, please send an email to don_csx@hotmail.com. Pictures used have be of your own collection or used with permission. When submitting pictures the bigger the better for detail purposes.

All pictures in The Mill are used with permission. If there are any questions concerning pictures used please send them to don_csx@hotmail.com and the question will be forwarded to the contributor of the photo.

Modeling Photos

Charles Porter's Wheeling and Pittsburg HO scale Steel mill.

Blast Furnace casting, Mingo Junction Plant.



Freshly pushed coke into Hot Cat heading to quencher.

Larry car spotting over oven to fill with coal

View of #1 Pusher machine.

View of 80" Hot Strip Mingo Plant

Slabs being scanned into inventory while #254 crane waits to move into stock

L-R view roughing mills with hot slabs leaving the roughing mills headed to the finish mills

Coils being shipped by rail and trucks from the Hot Strip Shipping

L-R Kress carrier in the Caster run out area

Engine 1255 pushing coke cars up the hill to the trestle

Engine 1253 dumping ore pellets into the ore yard from side-dump cars

BOF building looking at the north end where the hot metal cars enter

COLUMBIA RIVER STEEL CORP.

Part 1

Jeff Borne's HO scale CRSC

By Don Dunn
Photos by Jeff Borne

1 Hot metal cars waiting for the next tap at Blast furnace PW-1

The Columbia River Steel Corp. is set in Minnesota during 1985. The layout consist of two divisions. Steel and Nickel. The focal point of the layout is the blast furnace PW-1 that Jeff built from 1960 plans that he got from Michael Rabbitt. To get an ideal how big the blast furnace is the base is 2' x 4'. The blast furnace was built from a traffic cone and parts from Walthers' rolling mill kits.

Jeff's layout fertuered in the March 1999 issue of Model Railroader and in Model Railroader's Dream Plan Build video series. All of the structures are super detailed including the inside of some of them. Jeff also has a series of DVDs for super detailing a Walthers HO scale blast furnace. The following pictures are of Jeff's 4th layout. Sadly this layout has been dismantled and some of the buildings and equipment has been sold off.

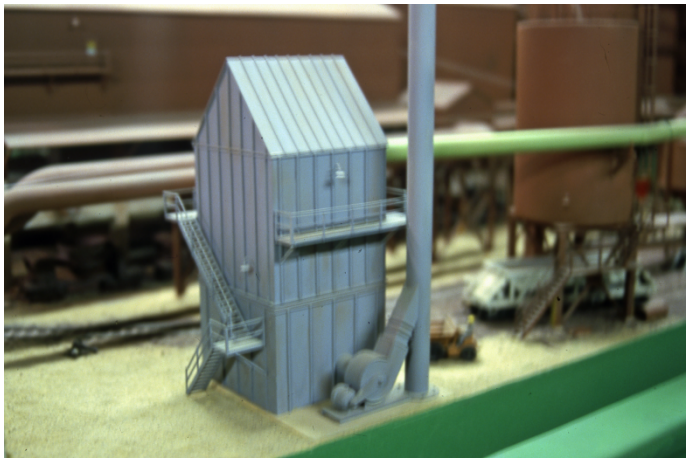
This will be a multiple part series. Part one will include pictures of the layout mill operations. Part two will consist of detailed photos of equipment and structures throughout out Jeff's layout

GE 70 ton #15 pushing hot metal cars by ore storage silos for the nickel smelter operations.

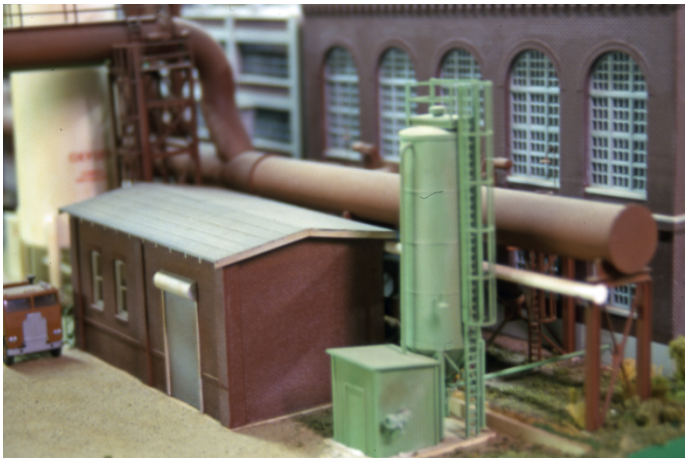
Alco S-2 CRSC #12 going by blast furnace PW-1 with a string of slag cars in tow.

Another shot of #12 going by blast furnace PW-1

Alco S-2 #18 on highline The storage yard is 2’ x 4’ including a pulverized coal facility at the end of the high line.



Baghouse for the sinter plant



Boiler house & lime hopper

Birmingham Southern #200 switcher going by fluid bed roaster

Birmingham Southern #200 switching tank cars at the nickel plant

Dorr Thickeners at the sinter plant.

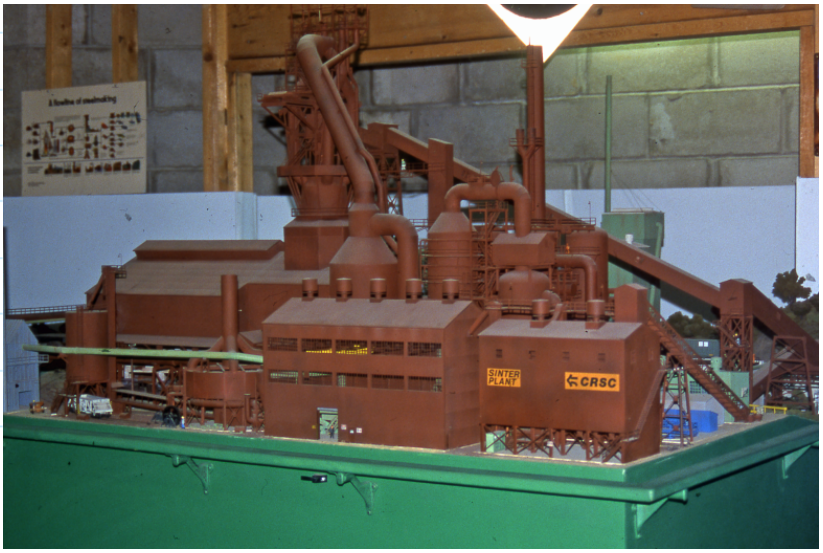
Alco S-2 #30 with a hot metal train

Another shot of #15 pushing hot metal cars by storage silos.

#15 back again this time with a string slag cars.

Acid plant
Fluid bed roaster
Nickel concentrate silos
Ladle/bottle car repair
Green Giant cannery
Building flats
Electrostatic precipitator
Nickel smelter
To east helix
Stack
Ingot slow cooling
Ingot crusher
Drop bridge connection
Schramm's box factory
Steel Junction
Control panel
Birch Island
Pellet loading
Slag dump
Passenger station
Control panel
Reagan
Lime receiving silos
Scrapyard
Concentrator
Bag house
Control panel
Slab billet storage
Grain elevator
Control panel, main line
Hairpin cooler
Sinter plant
Turbo blower
Joana
Boiler-house
Enginehouse
Stoves
Cast house
Continuous slab caster, continuous billet caster
Diesel fuel
Drum filter
Blast furnace
To west helix
Control panel, blast furnace
Passenger station
High line
2 percent grade up to blast furnace
Ore yard
Coal dump
Ore bridge
Yard office
West Carver
Coal dump
Coal pulverizer
Coal sizer
East Carver
Scale: ¼" = 1'-0"
12" grid
Control, branch line
Carver
Twin Cities & Western
Milwaukee Road main line
© 1999 Kalmbach Publishing Co., Model Railroader
Oil refinery
Petrochemical refinery
Toqueville
Coke oven
Quench tower
Minnesota River
Limestone
Buckley
Lime
Rush
Lime kiln
Furnace
Water heater

Blast Furnace PW-1 & Sinter Plant. The blast furnace along took five months to build .



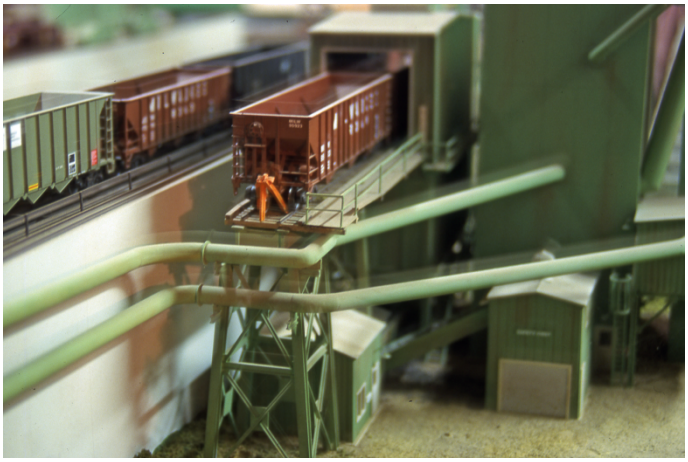
CRSC track plan by Kalmbach Publishing and is used with permission.

Hot Metal caboose

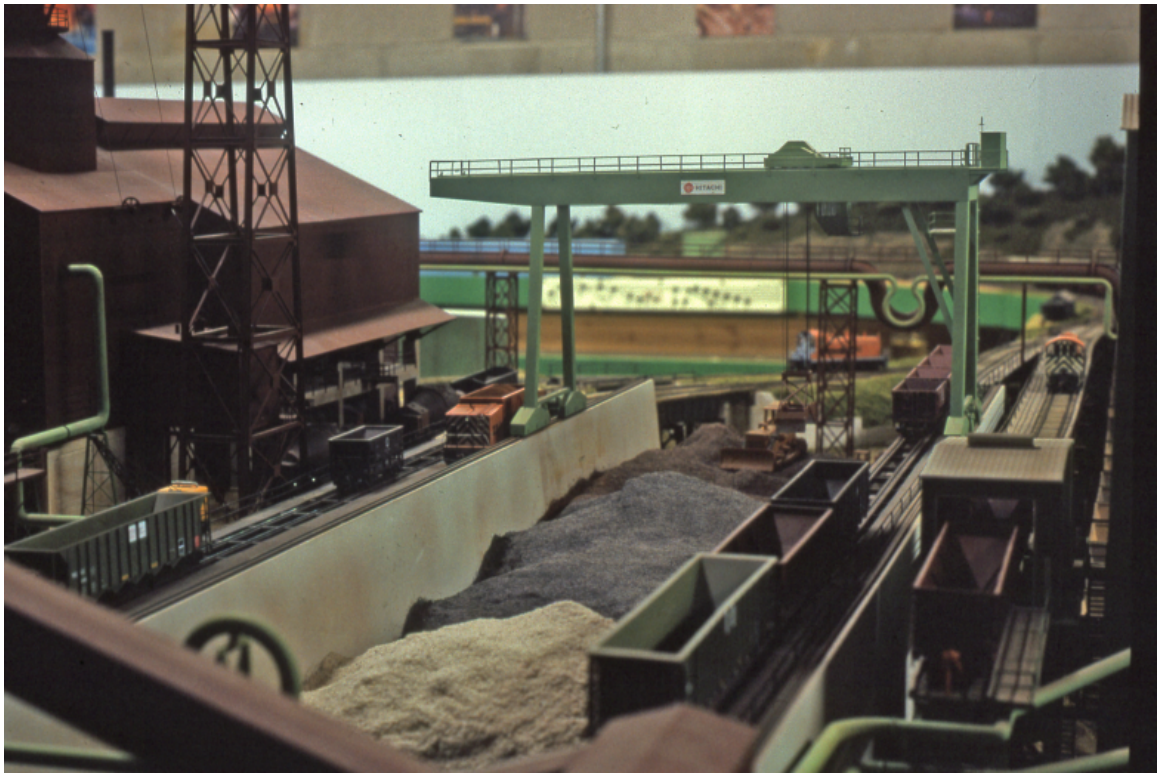
Shovel loading slag in truck

Ladle repair facility #4

Prairie Steel 0-4-0



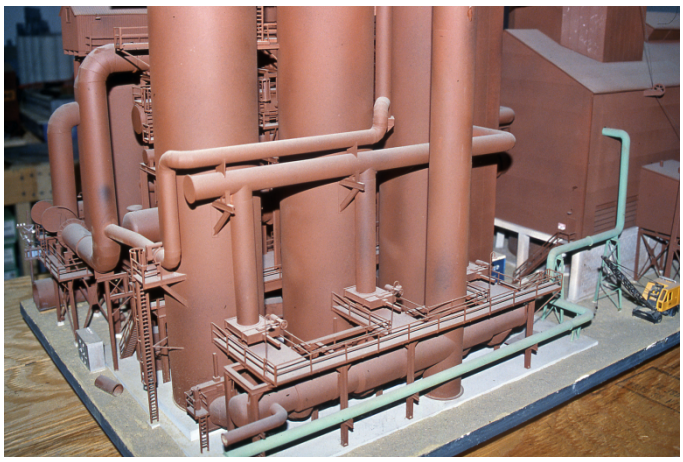
PCI dump trestle



Ore Yard PW-1

PW-1 conveyor dust concentrator

PW-1 highline ore yard



PW-1 Stoves

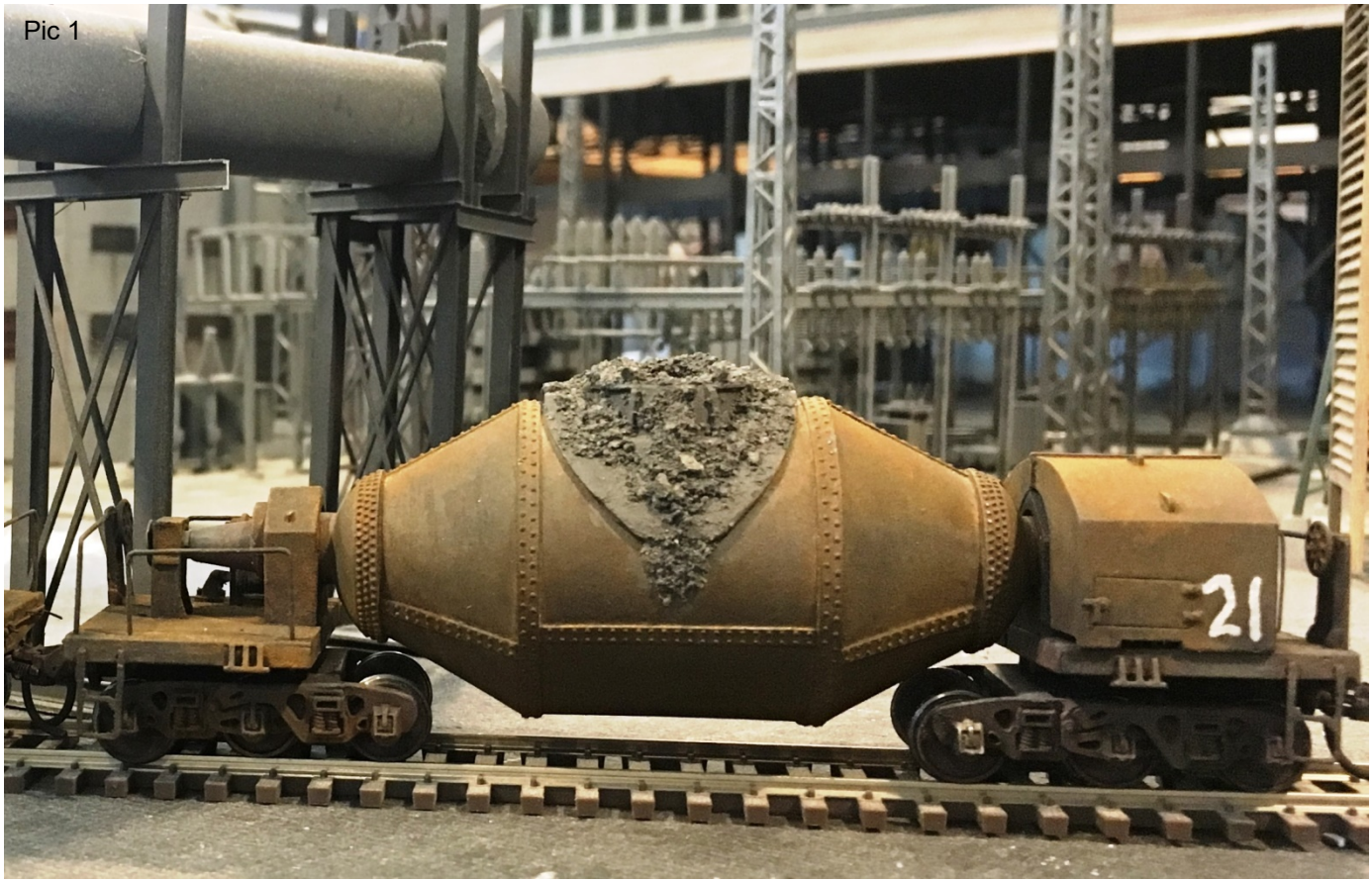
PW-1 ore yard

Ladle repair facility

Switcher between BF & Sinter Plant

Assembling the Schuylkill Iron Works Riveted Bottle Car

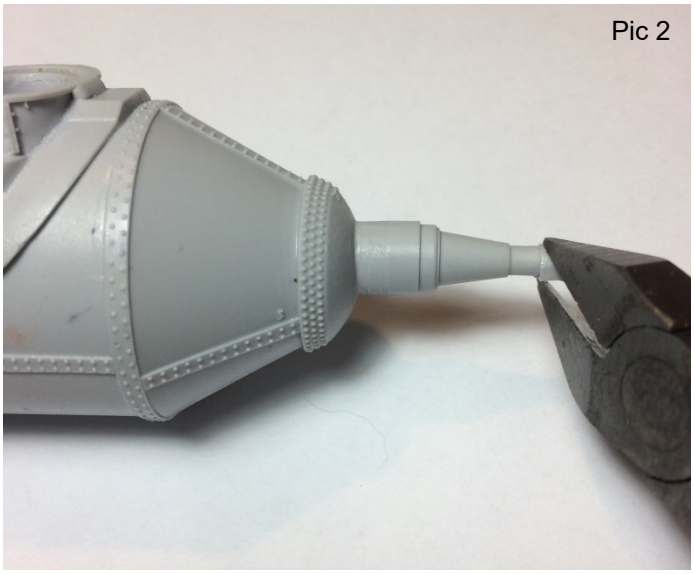
By Eric Craig Photos and Original Text by Steven Funaro



Pic 1

The following is a step by step instruction on assembling the Schuylkill Iron Works Riveted Bottle Car. This kit was manufactured by Funaro and Camerlengo, exclusively for the Schuylkill Iron Works. Go to their web site, www.theschuylkillironworks.com. The kit consists of a one piece bottle and the prototypical Buckeye trucks, less wheels and couplers. Many people contributed to this project; Jim Kerner, Mike Rabbitt, John Teichmoeller, Stevie Funaro and Steven Funaro. Steven built the master, scratch building the riveted straps and adding the end caps supplied by John. Steven is truly a master artist. (Pic 1)

The construction of this car is divided into three phases. The first phase is cleaning and finishing the bottle, second is building the end platform and third is the final assembly.

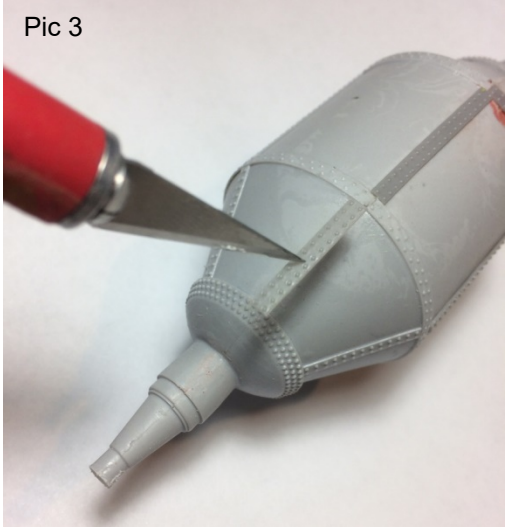


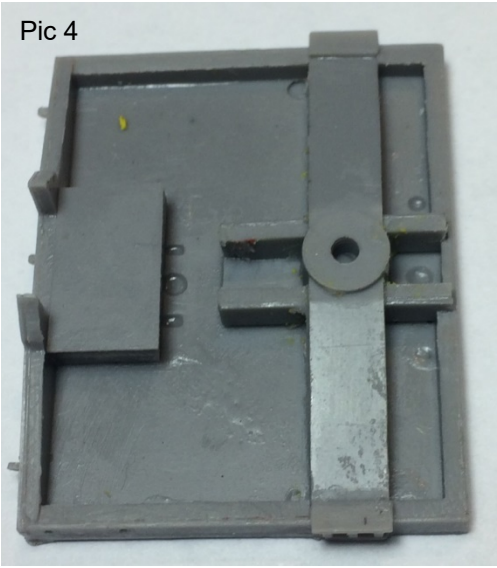
Pic 2

The Bottle

Step 1 Remove the bottle casting from the sprue. Be careful; DO NOT cut through the cylindrical bearings. We suggest using cutting pliers to nibble away at the sprues and finish cleaning with a small file or nail board. (Pic 2)

Step 2. Running across the bottom of the bottle is the parting line which is an unavoidable part of the molding process. There may also be a few bubbles in this area. They can be puttied and sanded, or if you chose, leave them alone so it looks like pitted corrosion seen frequently on these cars. The seam may be puttied and sanded as well or covered with the riveted strip castings that we have provided. Simply sand the seam and cut the strips to length and cement them in place. (Pic 3)


Pic 3


Pic 4

The Platform

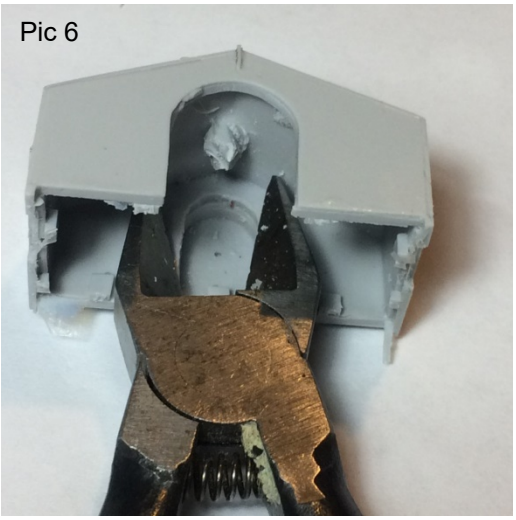
Step 3. Begin by cleaning the trucks of flash and test fit with your choice of wheels. I am partial to metal wheels. All my cars have them and Intermountain is my first choice.

Step 4. Next the end platforms are cleaned of flash. Turn over the platforms and note the dimples near the coupler mounting pad and opposite end of the bolster. These are drilled out to accept the mounting pins on the bearing blocks. Always start with smaller bits and work your way up. Square holes can be reamed after drilling out with a small jewelers file. DO NOT CEMENT the bearing in place yet. (Pic 4)

Step 5. Test fit your choice of couplers (not included). Kadee #5 or #58 will work with no modification. Drill appropriate mounting holes and secure the couplers with 2-56 screws (not included). At this point you can test fit the trucks.

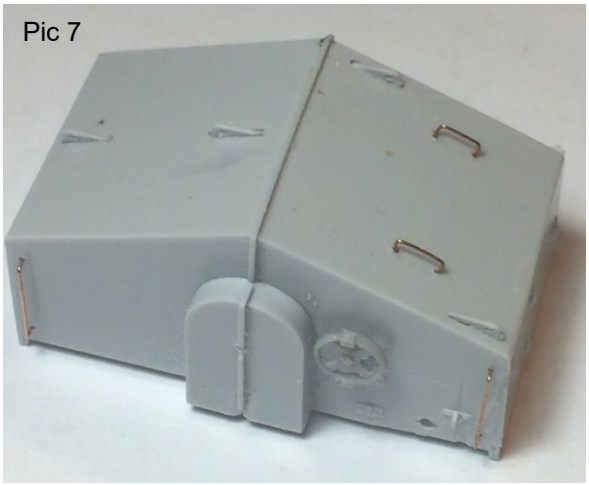
Step 6. In this step the bearings are cemented to the decks. We found it easier at this point in the construction to leave the trucks in place. Make sure they are not skewed. After you are satisfied with the fit you can slip the bottle in place to check the fit. DO NOT cement the bottle into the bearings. (Pic 5)


Pic 5

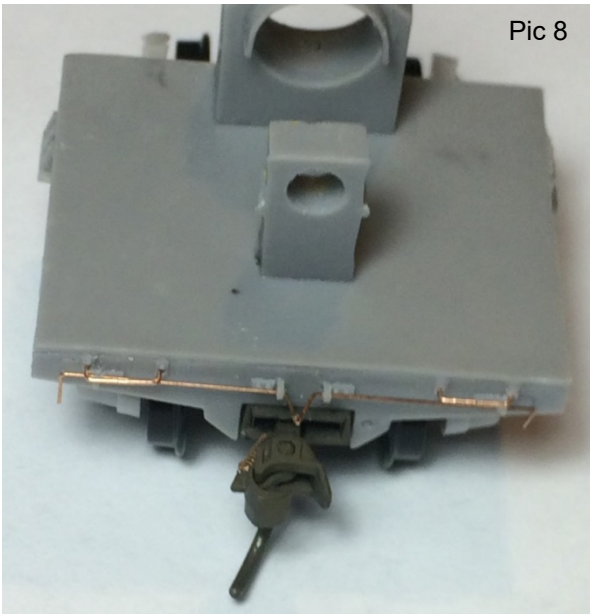


Step 7. The air motor housing is next. Begin by removing the casting sprue in the center with cutting pliers. If you try to cut it all at once you may crack the housing so just nibble away at it. Trim off the side bents the same way and finally use a #11 hobby knife to finish the job. In order to fit the housing over the bearings you may have to bevel the large bearing. DO NOT cement the housing in place until final assembly. (Pic 6)

Step 8. Note the dimples on the roof of the housing. If you wish to add the two small grab irons, now is the time to drill the holes. Since these grab irons are non-standard bend them from the provided wire. Insert them and secure with CA. (When building my bottle cars, I found it easier to drill new holes and use 18 inch grab irons grabs. You have to putty the one hole for each grab and sand it smooth - Eric.) Make the end grabs using the provided wire. Finally, add the dump hand wheel, mounting it with a short bit of wire. (Pic 7)

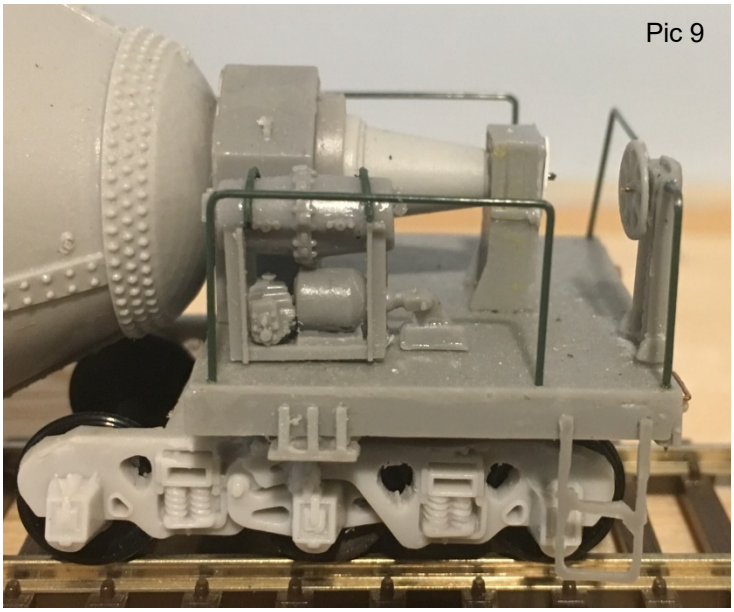


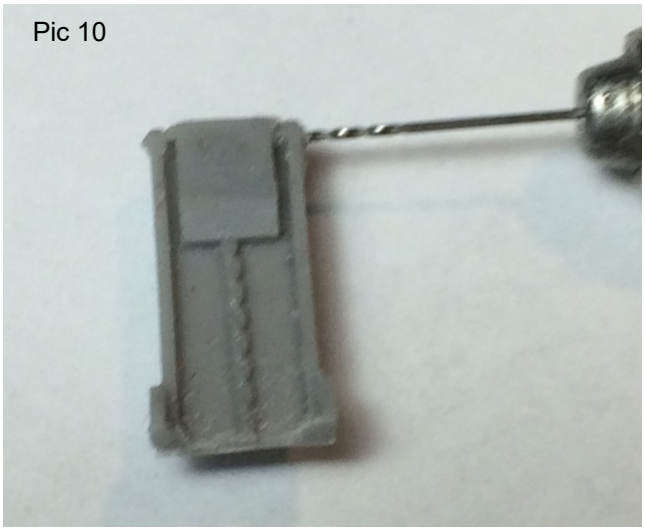
Step 9. The end of the platforms are detailed next. Begin by drilling out (using a #78 drill bit) the end beams for grab irons and cut leavers. After drilling out the grab iron brackets, cut the four straight grabs to length. Insert the grab irons and secure with CA.



Step 10. Form the cut levers from brass wire. Unlike most freight cars, these cut levers are analogous to a locomotive in that they can be operated from either side of the car. They are formed from two halves. The first bend is made before they are inserted into the bracket, the second bend is made after they are slipped in place. (On my bottle cars, I mounted the cut levers on top of the platform, using Tichy eye bolts. This would be prototypical – Eric) (Insert Picture #8)

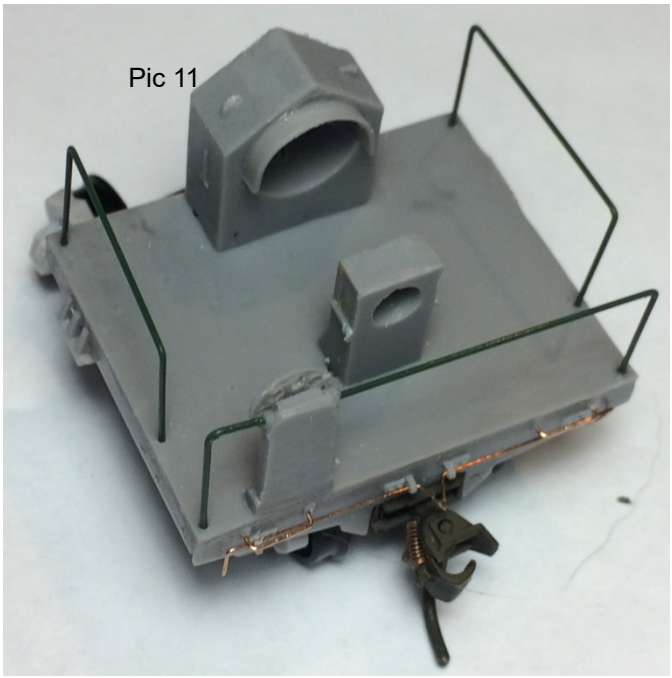
Step 11. Cement the break lever/air reservoir assembly to the auxiliary platform end of the car. (For simulating the mounting straps, I found it much easier to use .010 rod. Tried using wire and it was exasperating – Eric) (Pic 9)





Step 12. The brake stands are now assembled. First the small dimples on the top edges of the brake stand casting are drilled out for the hand rails. Next the center of the stands are drilled to accept the break wheel. Use a small piece of wire for the shaft. (Pic 10)

Step 13. Next the end platforms are drilled for railings and stirrup steps. Note that due to the air motor housing the railing arrangements are different for each platform. Remember to drill the appropriate hole pattern on the correct platform. (Pic 11)

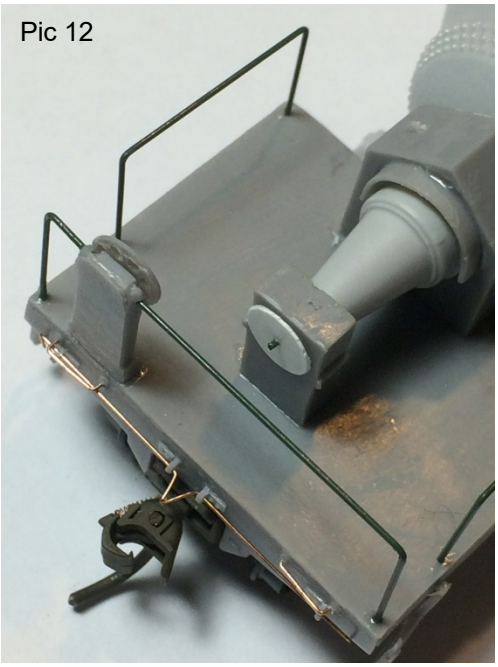


Step 14. Cement the brake stands to the end platforms.

Step 15. Bend and insert the hand rails from the provided coated wire.

Step 16. You may choose to cement the stirrup steps now or after painting. We recommend waiting until after painting and final assembly.

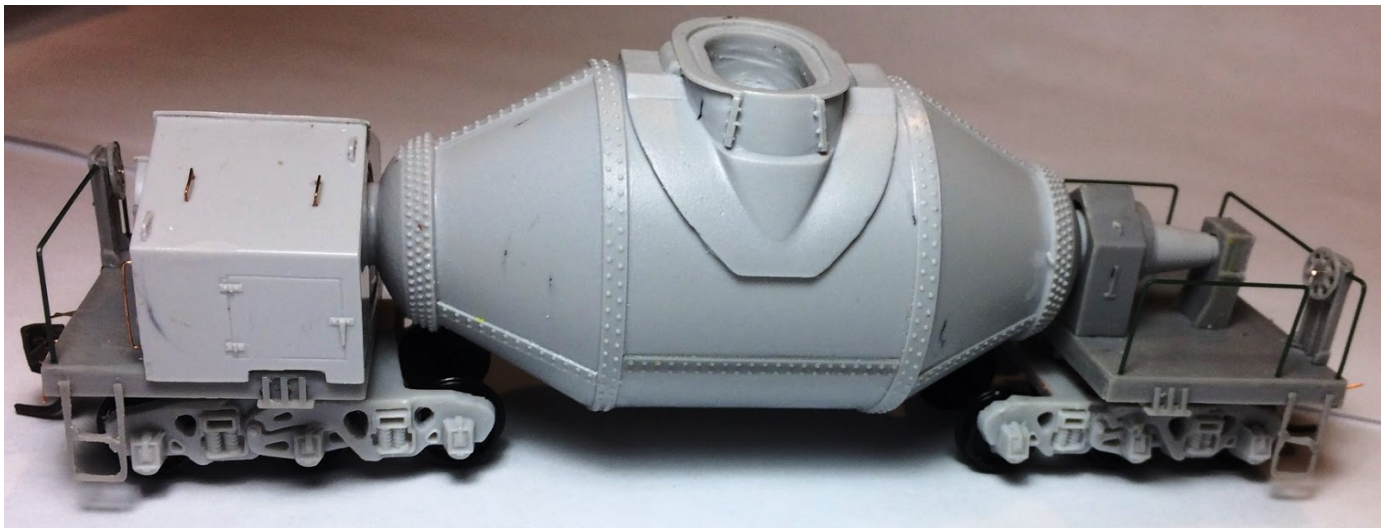
Step 17. The model is now ready for final assembly. You should have four components: The cast bottle, the detailed air motor housing cover, the air motor truck/platform and the auxiliary truck/platform assembly. You should make the final assembly without cementing the components in place so the model can be painted.


Pic 12

Step 18. Drill #74 holes in the ends of the spindle, and affix styrene discs to them with short bits of coated wire. This will allow the bottle to rotate. (Pic 12)

Step 19. Paint and weather.

Step 20. Put it in your mill and start making some hot metal.



Finished car before painting.

What's on the bench!

Treadwell Riveted Bottle Car with Buckeye Trucks
HO Resin Kit Produced for Schuylkill Iron Works
By Funaro & Camerlengo
Article by John Teichmoeller

Introduction and Oversimplified History

Over the years there have been numerous commercial HO models of hot metal bottle cars produced. From time to time, I have presented a two-part clinic on hot metal cars at steel, NMRA and Prototype Modelers meets. In this clinic I offer my understanding of the history of these models (and their prototypes). Part 2 of this clinic covers bottle cars including the subject of this present write-up. This was last presented, if I remember correctly, at the "steel track" of the 2014 NMRA National Convention in Cleveland. If you missed it, keep your eyes on announced presentations at future meets in the Middle Atlantic area. Oh, yes, it will need to be updated with the addition of the subject car.

Accordingly, I won't repeat all the detail except to cite what I would call 3 "antecedents" to our subject model. These are all models of a nominal 150-186 ton, six axle car. They include 1) a brass model imported by "AWE Enterprises," 2) a "kit," actually a set of Plastruct materials to build a car accompanied by an article in Railroad Model Craftsman and 3) the well-known Walthers injection molded car. Model 1 came out in 1994. Model 2 was published in the 11/94 issue. Model 3) was released in 1996 as part of Walthers "The Works" project. At the time these models were released, we were all delighted to even have them. Nobody published any nitpicking articles or reviews in the enthusiast press about "fixing" any discrepancies. Most of us little cared that no prototype information was provided for the purchaser of any of these models. So now let me offer some common observations about these cars. These observations are based on my study of actual specimens and photos of prototypes. I am forever hopeful that someone would research the definitive story of bottle cars; this would be based on articles in technical publications and advertising in trade journals and ideally research in various industrial archives and would correct any misinformation I have propagated. So based on my study, the three model cars cited above have combined characteristics of products of the M.H. Treadwell Co. of Easton, PA and the Wm. B. Pollock Co. of Youngstown, OH. They appear to be pretty much an old Treadwell car that had been upgraded by Pollock with an all-welded bottle and "shed style" machinery housing. However, from what I have seen, even when Pollock rebuilt Treadwell cars with welded bottles, they seem to have retained the distinctive riveted "end cap" (termed "trunnion" on the drawing). None of the above 3 models bears bottle rivet detail, especially on the distinctive end caps which has 3 rows of 60 rivets each. At least now, thanks to Tim Schwartz and Shapeways you can purchase the 3-D printed caps (search on "trunnion cap") and apply styrene strips with rivet decals to the bottles of the above cars so you no longer have to cry "honey, they stole the rivets." Even better, thanks to this kit, you can avoid adding that rivet detail and put your brass AWE car, your Plastruct "parts set" or your Walthers car on e-Bay, because this kit pretty faithfully represents a "stock" Treadwell car.

A word about "capacity:" The Walthers car has never had any capacity claimed. The AWE brass car, which is physically identical to the Walthers car except it has a proper rendering of the pouring spout, was claimed on the box label to be of 168 tons capacity. The main variable in these bottle cars was the length of the central "barrel"—all cars seem to have had the same barrel diameter (the length of the cones was greater for some larger capacities, too). So when I try to decipher the various drawings in my collection, this model car would appear to be closest to the drawings of a 150 ton car. Keep in mind the classic Kling car "spherical ladle" (State Tool & Die) long favored by U.S. Steel was rated at 75 tons. Does it matter? Yes, maybe to the steel modeler who is trying to operate with runs synchronized to blast furnace capacities which determine tapping times which determine hot metal runs to the mixer, etc. Many modelers will just be happy that we have a proper looking six axle riveted car.

Kit Summary
The kit consists of grey resin castings for all the components of the car. These include the hot metal bottle itself, end platforms, inner and outer trunnion bearing posts, air brake component assembly and rotating machinery housing. In addition there is a sprue with some additional details. Flash cleanup is fairly minor, and the resin is soft. The one-piece resin plain bearing Buckeye trucks are a nice feature, as these could set you back upwards of $15 if you buy them separately. (I will probably use the Walthers roller bearing trucks for one of my cars because they are prototypical and I like them.) It should be pointed out that this car is the same size as the Walthers car so it will fit your cast house if it is already accommodating the Walthers car, a small but important point to mill "operators."

The instructions break down assembly into 19 steps with illustrations for each one. The steps and illustrations all appear pretty straightforward to me; the biggest area of complaint about resin kit instructions usually involves the finer aspects of the underbody or end detail, and this car just does not have those issues to deal with. I might add that the quality of the detail and the relative cleanliness of the parts in this kit demonstrate that Steve Funaro has truly become a master of his art. He has a number of projects near to my heart on his list, and I encourage his progress!

Construction Comments
Let me offer some comments about selected steps in the instructions with the idea of giving you some alternative ideas.

Step 2. Bottle cleanup and them pesky rivets. This step suggests either filling any voids on the bottom central parting line with putty or covering them with rivet strip material provided. If you are a dedicated prototype modeler and/or your friends are nitpickers, I suggest you fill rather than cover because there should NOT be a rivet strip on the bottom ("6:00" if you consider the cross section of the barrel as the face of a clock). Prototype drawings show there are only two barrel rivet strips and they are at 4:00 and 10:00 on the drawings. There are three rivet strips on the cones, and they should be at 1:00, 5:00 and 9:00. (By staggering the rivet strips on the bottle, I presume the design engineers were trying to see that the forces on the bottle shell were better distributed.) The barrel rivet strips on the resin bottle are a bit "off," at 3:30 and 8:30 and on the cones at 12:00, 4:00 and 8:00. I'm **not** suggesting you grind them off and replace in the proper position. Besides, if you add a "splash shield," its bottom edge will come down about to just above the barrel rivet strips, and this way you won't be covering up the rivets. And as long as we are talking about rivets, let me compliment resin master Steve on executing the circumferential barrel strips —they are correctly done as two rows of staggered rivets. Enough rivet counting.

Step 6. Bearing blocks—just a comment: the kit's inner and outer trunnion bearing blocks (as well as those on the Walthers and AWE cars) are oversimplified for a Treadwell car. The inner bearing block appears to resemble those typically seen on Pollock cars. But for extra credit, you could use the height above deck dimensions of the kit parts to fabricate prototypical parts (see prototype photos) from styrene—make a master for each and cast your own in resin, or find a "maker" to produce 3-d printed versions of these parts.

Step 7. Labels this as the housing for the air motor. Actually it is the housing for the electric motor and gear train. I know Pollock and Treadwell offered air-tip slag cars but all the hot metal cars I have seen are electrically powered. Maybe they did offer an air-tip bottle car. The kit's housing represents the style you see on Pollock and Reichard cars, but it's OK to use it on your Treadwell car here because it may have been refurbished by Pollock. The engineering drawings of Treadwell cars show a multiple curved housing. It is rendered in more or less phantom form on the general arrangement drawing photocopies that I have so I may offer a sketch in the future if there is any interest. Roger Camplin made a curved housing to fit the base of the housing of the Walthers car. He described his project in Vol. XX, No. 1 of *Lineside,* but the article showed only a photo, not a drawing of his housing. I have never seen the detailed Treadwell drawing for this part--which must have existed--and in service there seem to be a variety of shapes for this machinery housing, I believe a "curved" machinery housing will be offered for these kits. Again, for extra credit you can have the motor, primary

gearbox, secondary gearbox, bull gear (around trunnion) and bull gear housing 3-d printed by a friend and omit the cover entirely.

Part No. 6 which looks like a dress snap is the safety wheel for use to turn the bottle when the motor is kaput. It mounts on the back of the housing like a life ring on your yacht, and there is a hole in the housing in line with the motor shaft where it is engaged—for extra credit, you should be able to see the end of the shaft in the hole.

Step 10. The kit renders cut lever eyebolts with protrusions cast in resin on the surface of the end sill and only need drilling for wire cut levers. F&C have been doing this on recent cars, and I like it. However, I will simply share my observation that all the bottle cars (and slag cars) I have seen have their cut lever eyebolts mounted up on the deck, not from the end sill. So you could use Detail Associates 2222, three on each end, and do the two piece, double sided cut levers with a quick touch of solder in the middle to fuse the two pieces.

Steps 11 and 12, railings. The railing scheme in the kit is simplified and pretty much duplicates the treatment on the Walthers and AWE cars. From the prototype photos, I swear they're all different. Consider using parts of Tichy's 8193 Strap Railings or for durable vertical stanchions Plano's photoetched 320, Roadrailer Coupler Mate Detail Kit. If you do these, you will probably have to reposition the brake wheel stands inboard so don't glue the stands in place until you sort things out. For extra credit, from each end sill hang safety chains with 10" hooks from John Rendell, No.8483.

Step 15. Stirrup steps—particularly well done in resin. Since they are flexible, I suspect they will not break off readily. If you expect rough treatment, try Bethlehem Car Works KitBits Baggage Car Steps No. 88 which are photoetched brass.

Step 16. Final assembly-I recommend Method 2, rotating bottle. More fun, and you can turn it upside down when the car is not in service.

Step 18. Paint. For new cars from the factory or rebuild shop, most companies seem to paint the bottle silver and some other bright color for the machinery housings and sometimes other platform equipment and even truck side frames. Edgar Thomson in Pittsburgh used to and maybe still does use light blue. My Principio Steel uses orange.
For delivery in trains, run the bottle upside down.

Final notes:
Air brake package: I didn't see any mention of the nice air brake assembly in the instructions. You may not even need air brakes if you are running in-plant only and it's a short run between the blast furnace and steel furnaces. Sparrows Pt. No. 127 at the B&O Museum has no air brakes. If you use the part, install some visible air lines from match-softened .010 wire between the reservoir and AB valve. Add a splash shield around the spout if you like.

Don't forget the alignment arrows between the bottle caps and inner trunnion bearing. I make my arrows from smashed .020" soft iron wire which I make points on with a nipper.
Add an outside air line from .015" wire running through a couple eyebolts on the side of the car facing you when the machinery housing is on the right.

Disclosure/Disclaimer
I have no financial interest in this kit and did not participate in its production beyond providing Eric with a CD containing some prototype drawings and photos. I presume Steve Funaro used the 3-D riveted end cap from Shapeways to make his master, which was one of its hoped-for uses. I've

been harping for this model for years! Now, does anyone want to buy one or more of those brass AWE cars?

Suggested illustrations:

Pic 1
Caption: Sparrows Point No. 127 Overall view at B&O Museum, Baltimore. Car has splash shield around spout. Note distinctive Treadwell 6-wheel trucks. Maybe a future F&C product? 3-D “makers,” I have the drawings.

Pic 2
Caption: Machinery end, Sparrows Pt. 127

Pic 3
Caption: End view machinery Sparrows Pt. 127

Image No.4
Caption: Treadwell 6-axle car in use as scale test car at Sparrows Pt. in 1995.

Image No.5
Caption: Youngstown Sheet & Tube No.23 Castlo Industrial Park, Struthers, OH, Note “stock” machinery housing.
Bottle has been partially turned with the goal of preventing water buildup inside. See the turn wheel on the right. The “turner” gave up after a zillion turns. No. 21 in rear has a Pollock welded bottle and modified machinery housing. These cars need to be moved to Poland Ave. by 12/31/18 or they may be cut up.

Image No. 6
Caption: USS Fairfield 4-truck car showing “stock” Treadwell machinery housing and “Treadwell” lettering cast or welded on side of bottle

What's on the bench!

Last issue Heinz showed how he made the Hot air blast furnace ring. Part 2 Heinz makes low-cost tweeters (tuyeres, blow moulders?) for the blast furnace ring.

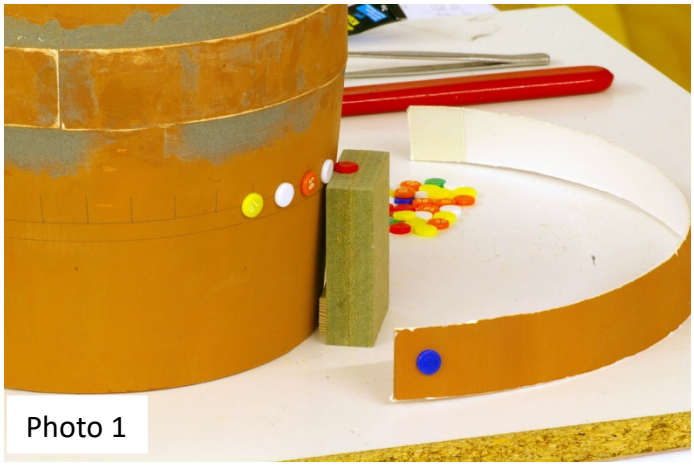


Photo 1

(Photo 1) I used chips from a toy roulette as flanges and glued them all around the corpus at marked positions
.

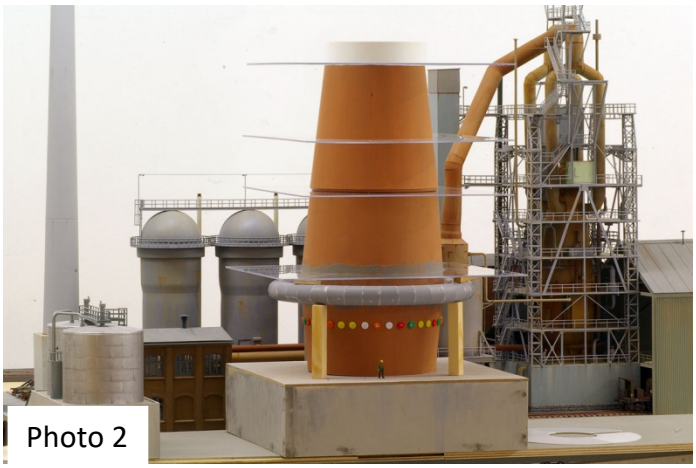


Photo 2

(Photo 2) Checking distance to the desired location of hot blast ring

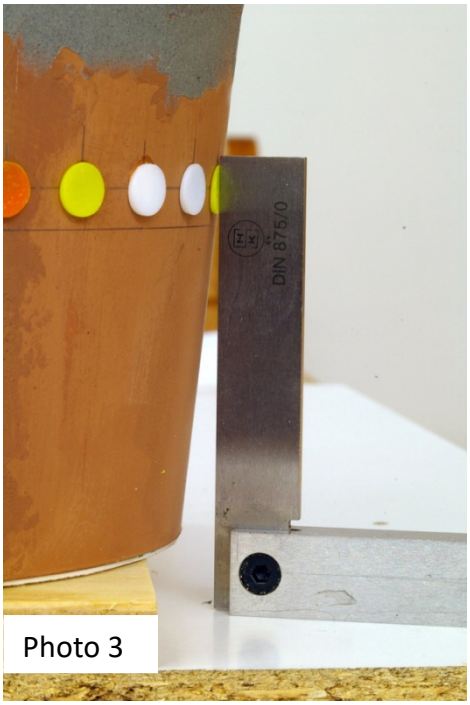


Photo 3

(Photo 3) Surfaces must be filed/sanded for vertical alignment

(Photo 4) After some search I found low price pipes from a garden watering system, in addition small rims that were left from Kibri heavy load trailers and some Evergreen parts

Photo 4

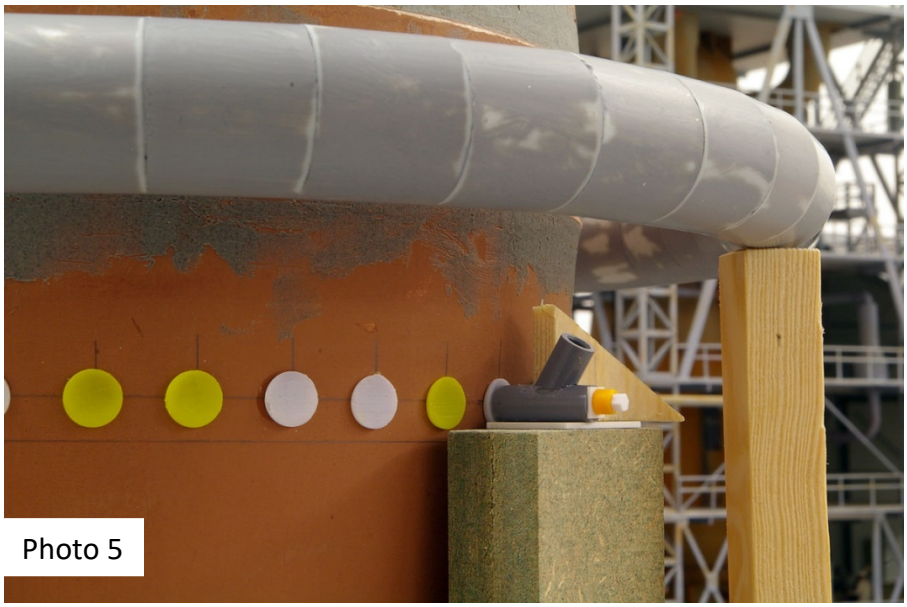


Photo 5

(Photo 5) Put the first one in place using gauges

(Photo 6) Little wooden rods were cut to approximate lenght. Pieces of drinking straw adapt diameter to Evergreen pipes, some heat shrink tube is cut for test purposes

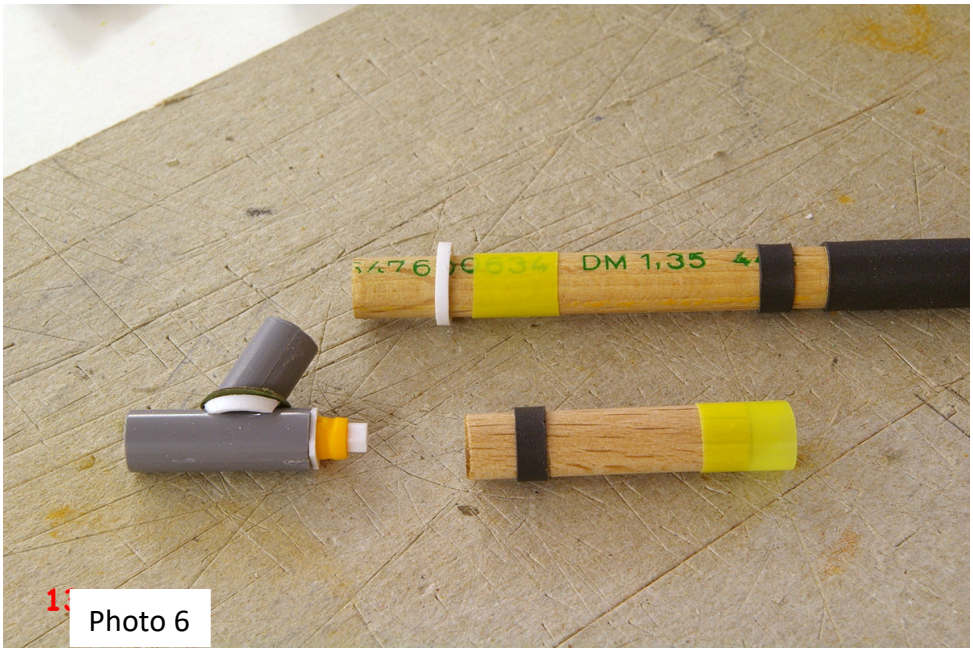
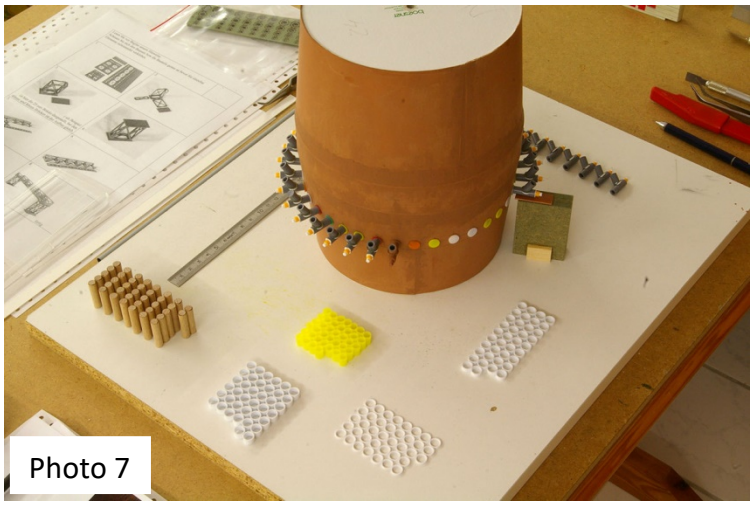
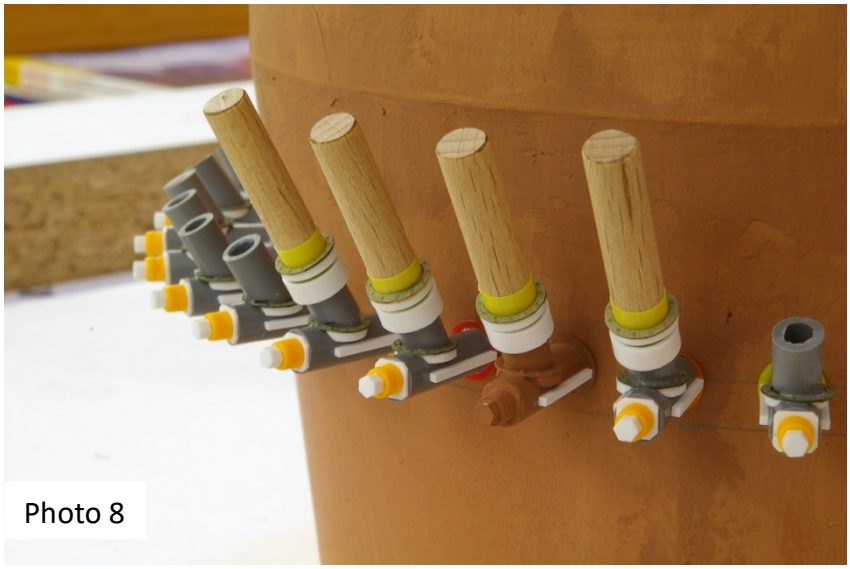


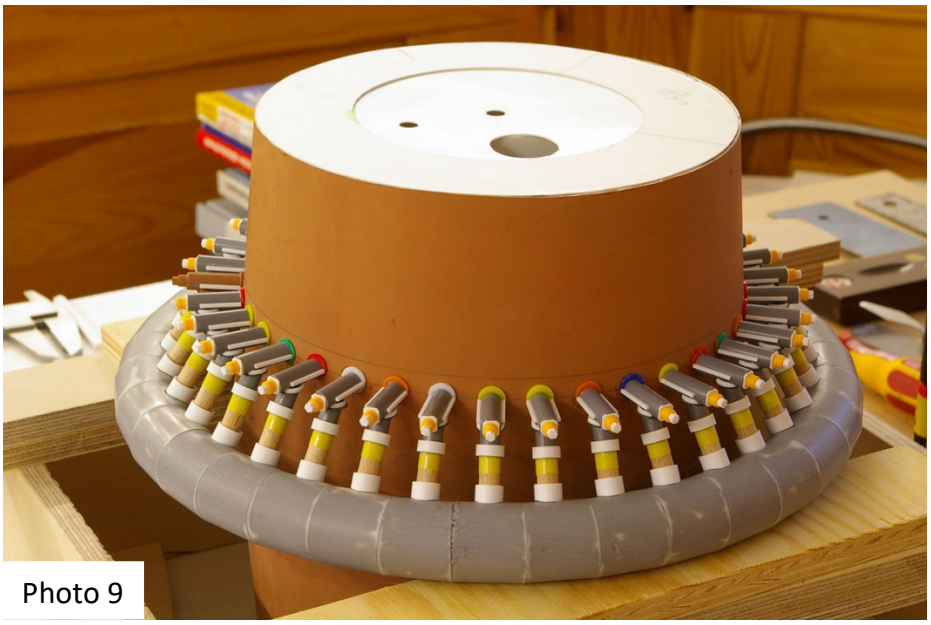
Photo 6



(Photo 7) Working around the body while further connection parts were prepared

(Photo 8) Test arrangement. Cardboard flanges are from Joswood





(Photo 9) For final assembly, blast furnace hat to be turned upside down. Furnace and blast ring are held in position, so I could plug each rod with all accessories on it into a hole in the blast ring an then glue it to the tweeter by pushing it upwards. Finally I glued all (in this position 'lower') sleeves to blast ring and rods.

(Photo 10) Great excitement while turning back the whole thing to upright position!
Fortunately it was all okay, so I quickly painted it before anything could go wrong….

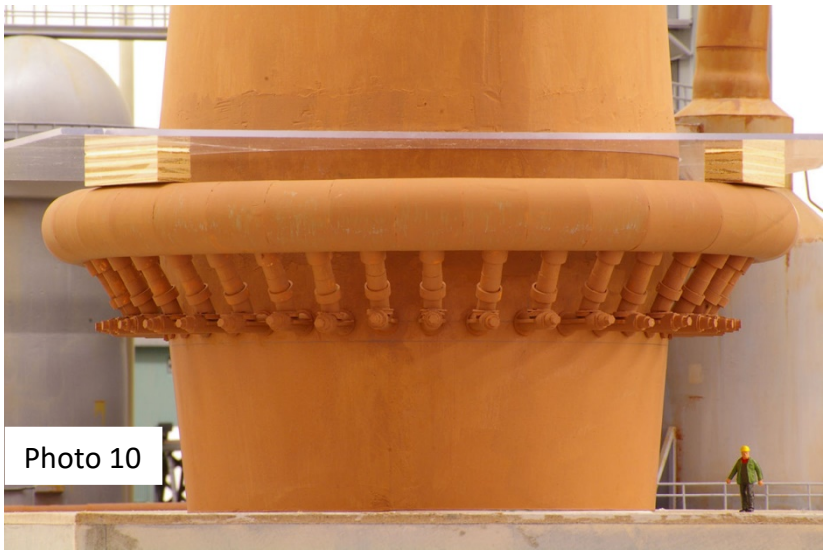


Photo 10

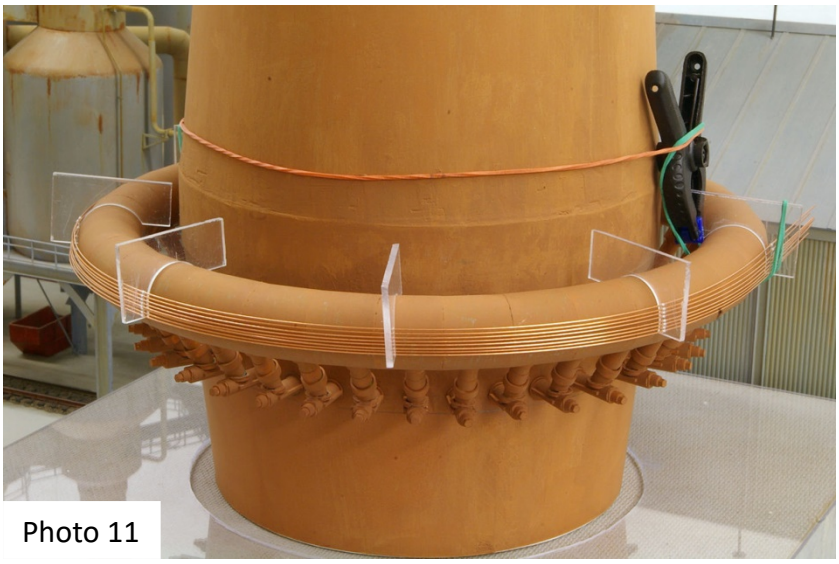


Photo 11

(Photo 11) Next task is the carbon dust injection linings. I cut some plastic parts to an approximated shape, drilled holes and pushed 0,5mm (0,02") wires through them

(Photo 12) Now I need small connections for small wires. I used revolving signal lights which were left from Kibri Trucks and tried to drill holes in a crosswise way

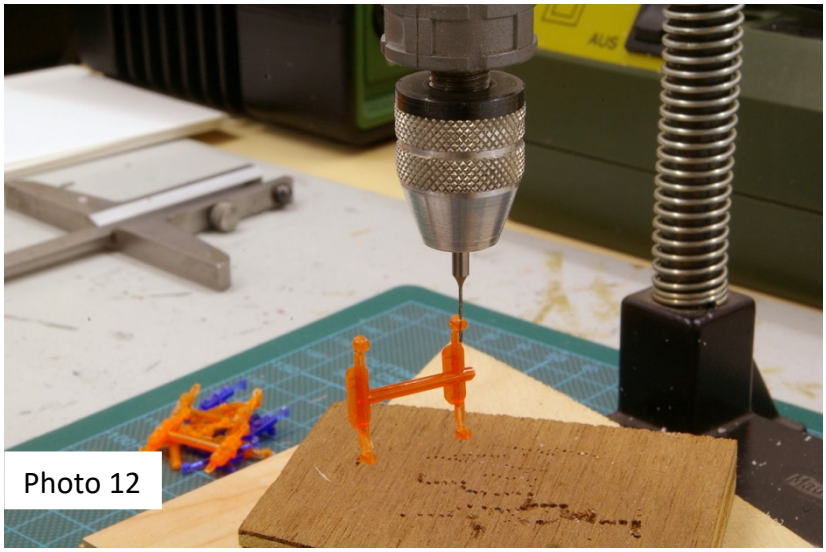
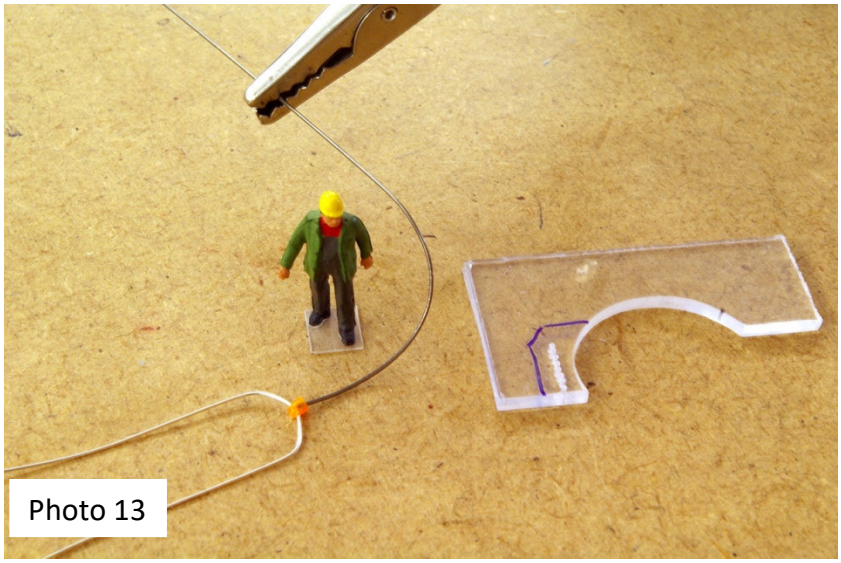
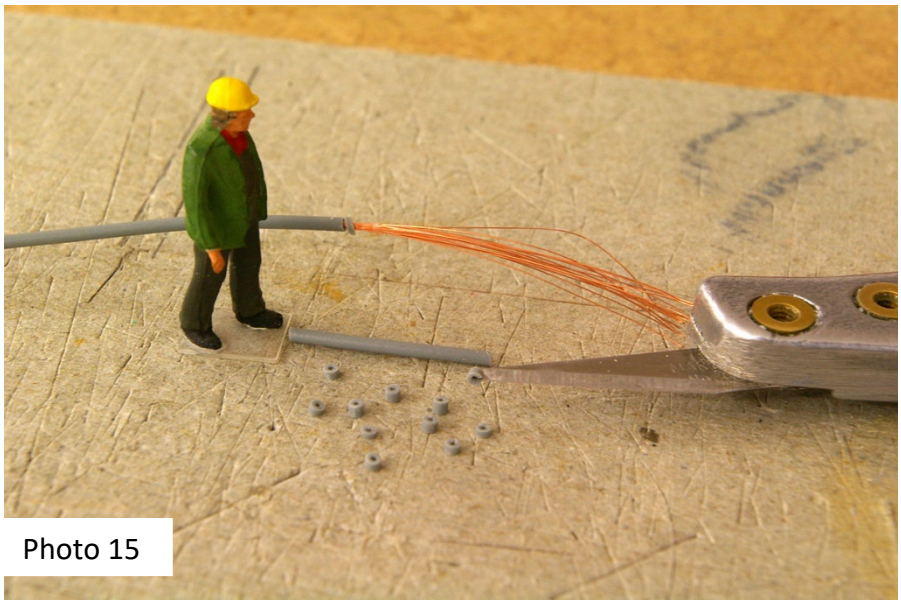


Photo 12

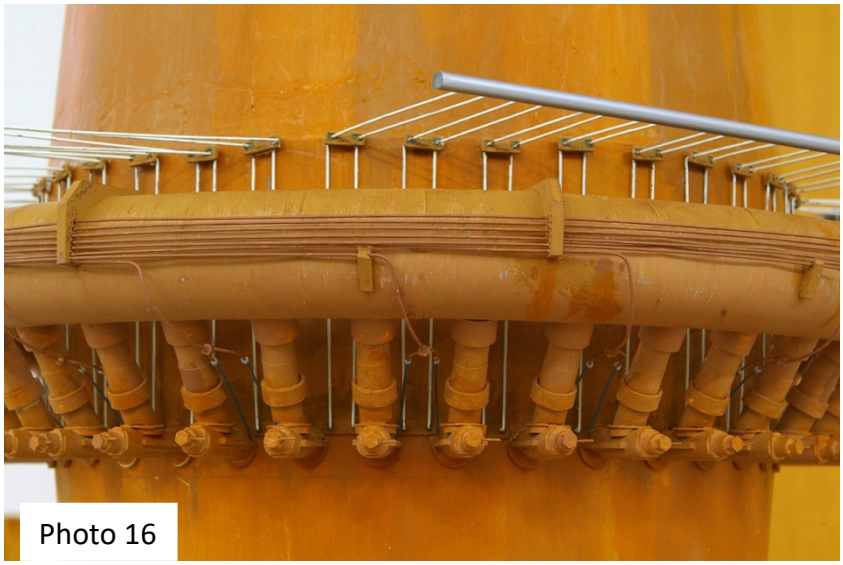


(Photo 13) After successful drilling I was able to split each wire into two

(Photo 14) Some time later the raw construction was completed

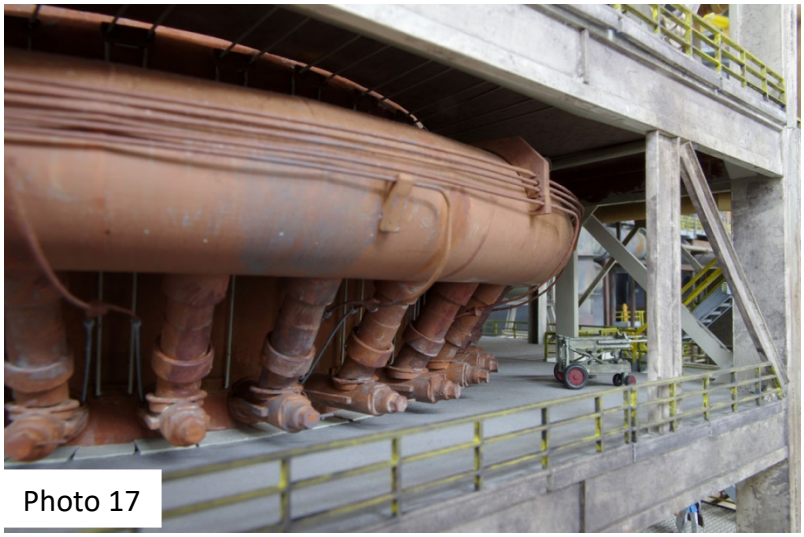


(Photo 15) Some wire insulation is prepared to depict little flanges



(Photo 16) Carbon dust injection system is completed

(Photo 17) Final fiew of the finished blast ring



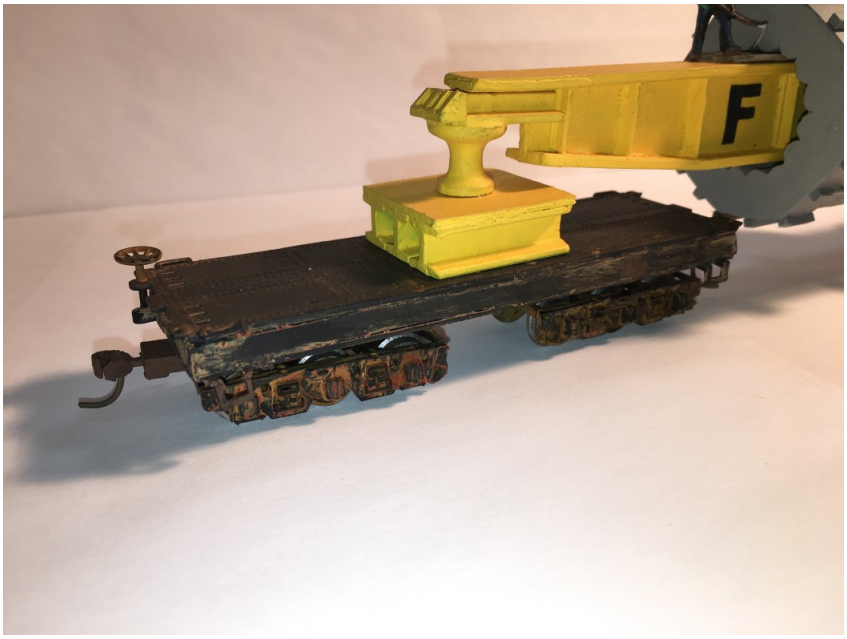
Heinz built his blast furnace from scratch. Here is the casting hall and baghouse for his mill. With the furnace in the back .

Short Story

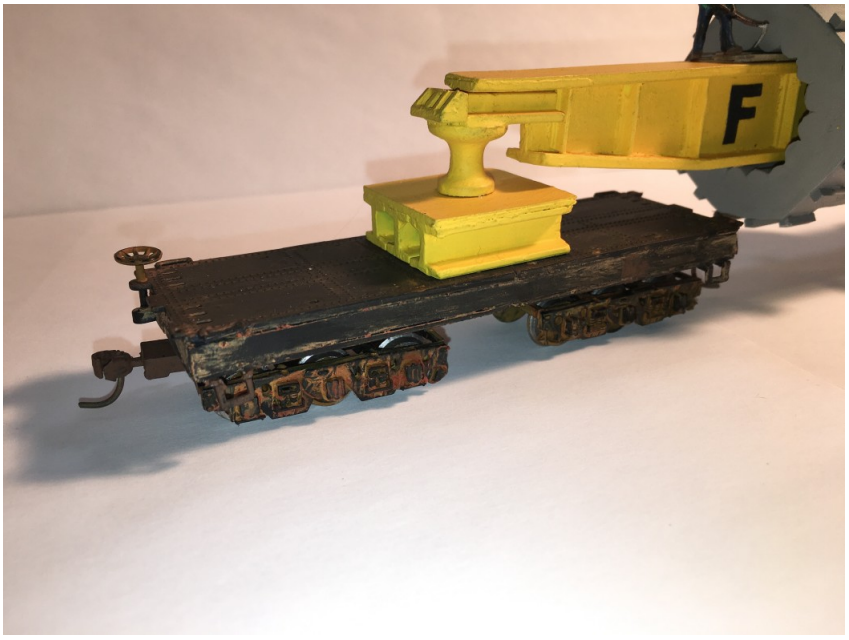
Last issue our friends at Franklin Forge and Gear showed us how to build a 93 ton ingot mold. This issue FF&G gives us a short story of why a mold this size was built.

Back in the winter the Franklin Forge and Gear was bidding on some upcoming naval contracts that required some unusual heavy plate material be made. They won the contracts and now had to work on acquiring the necessary ingot molds to start casting large amounts of steel so it could be forged into the required plating needed. Realizing, early on, that they would not be able to meet their target date of supplying such a large amount of plate to the government if they did not have more large ingots molds to cast the steel, they needed to formulate a plan. The issue was not the forging, pressing and treating the steel; they had more than enough capacity. What they needed was to work with another steel company to make FF&G more ingot molds. The engineering staff figured they needed at least 30 of them made. So, FF&G sub-contracted out making a few of the ingot molds to D&D Steel out of Viper KY. D&D Steel was very cooperative in helping FF&G out. The only issue was how the FF&G was going to transport a 93 ton ingot mold across the country to their mill.

This dilemma was put to the Transportation Department to solve and it needed to be solved YESTERDAY!!!!! The government was not waiting and it was such a lucrative contract that even with a sub-contract to D&D Steel Not the profit margin was just overwhelming. Many steel companies were big enough to pull a project like this off, from beginning to end. But it just so happened that one of the insignificant clerks in the Trans Dept. was looking at an old steel mill photo album and came across an old picture that showed a relatively large ingot mold being transported decades ago, from the Armstrong Witworth works in Openshaw, Great Britain going from one mill to another. So, he proposed it at the next meeting they were having about the current situation. He was told he would be in charge of working with the engineering arm of the company and try to find more information. However, after hours of due diligent searching he was unable to find out any other information about this unique way of transporting an overly large ingot. All he had was a picture.



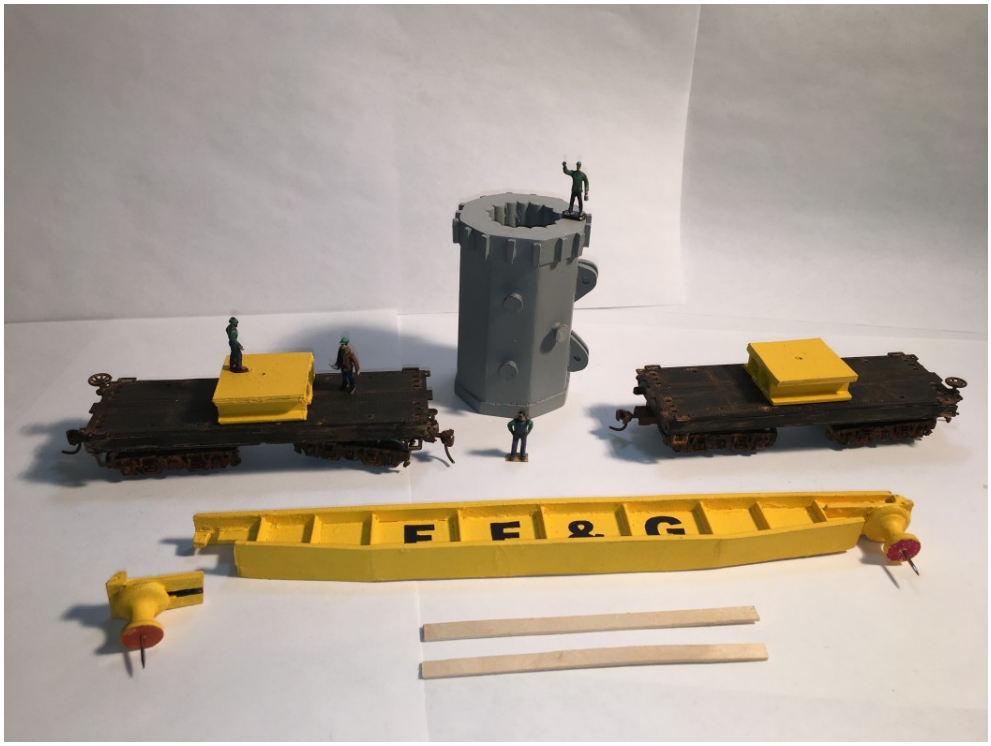
When he approached the Engineering Department, they were at first skeptical, because they had planned on using a large depressed center flatcar. The only problem was there were a quite a few bridges they felt might not withstand the load due to the high, wide nature of the load and obtaining the permits was going to be a nightmare. But they felt that this crazy concoction might just work. So then the usual flurry of meetings and off sites was held. Steamers Diner across the street from FF&G was doing a brisk business in supplying coffee and specialty cinnamon buns for these meetings. Of course there were the usual meeting trolls that just came by for the coffee and cinnamon buns and actually offered no insight to the problem at hand.



The final version of the plan was quick and simple in the end. They would take a couple of shortened 200 ton flatcars (shortened for stability) that were currently being used on the road and make a pillar that rotated on a base welded to the top of the flat car. Between these two rotating pillar there would be suspended a large center beam that would be specially constructed a specific length for the ingot mold to sit just high enough off of the rails to clear any obstructions, but low enough to not have a high center of gravity. This would ensure the stability of the load. This would also get the load over the weight restrictions on some of the smaller bridges. But the only nagging problem was the potential for damage to the flutes inside the ingot mold during travel. One troll in the meeting was messing around with a wooden coffee stirrer and said, “I have an idea”. Everyone looked at him in astonishment. He said, “What if when we slid the beam into the ingot mold for travel, we took some heavy duty thick planks of wood and JAMMED them into the opening between the ingot mold and the beam. Then the wobble of the ingot mold would be stopped and the flutes would be protected”. The engineers pondered the proposition and looked at a largely blown up version of the original picture. They turned to the troll and said, “That was it!! That was how they done it all those decades ago!!!”

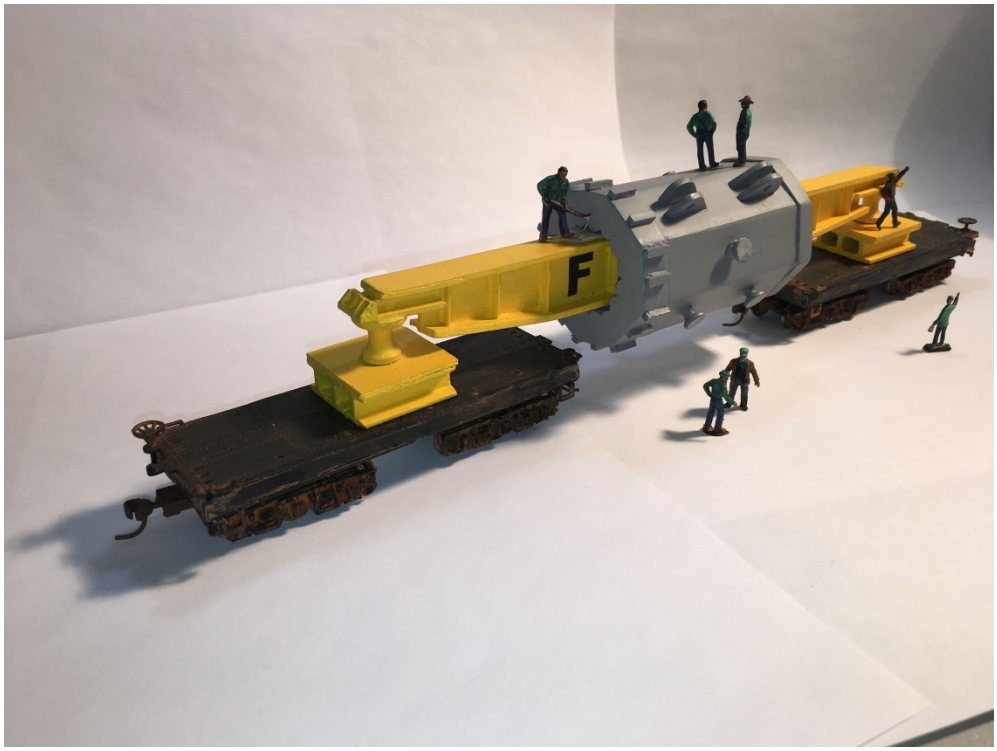
The Car Shop Foreman was then told to go and pick out a couple of the best condition 200 ton flatcars he had and start reconditioning the trucks and shortening the frames. Once the Engineering Department delivered the plans the superintendent was to garner his forces and get the job of making the mounts of the pillars done quickly. The Bridge and Building Dept. was starting to build the center beam under the Engineering Dept. instructions. They had drawn up the plans for a new mill crane earlier and just went about modifying the beam some. They figured after this project was over with the center beam could be turned back into a crane beam and the cars could get the rotating pillar support cut off and returned to service.

The Bridge and Building Dept. actually finished their part so early (something about Brats and some adult beverages was rumored to be involved), that the Car Shop Dept. did not have time to recondition the cars the way they wanted them but just did the trucks and shortened the cars. But this was great news because the Car Shop was able to assemble the car ahead of schedule and trial it out on a part of the trackage to the mill. It turned out to be a quick and easy solution to get this project completed. All the departments came together and were able to get it done under budget and ahead of schedule.



In the end it worked out great because D&D Steel could produce one ingot mold and by the time it was made, finished, and loaded on the beam car, and was shipped to FF&G, unloaded, and the empty beam shipped back to D&D, there was another ingot mold ready for transport.

Shipping the empty cars back to get another ingot mold was quick and easy. The beam was shipped on a regular 50 ft. flat car and coupled to the 2 empty pillar cars.



Around the Mill

Pictures by John Mill of Jewell Coal and Coke in Vansant, VA


NORFOLK AND WESTERN
8511


NS
NORFOLK SOUTHERN
8553

Steel Mill Related Videos

Green Frog Productions
*Styrene The Ideals, Tips and Techniques of Dean Freytag.

PCN Tours
*Joy Mining Machinery
*ArcelorMittal Steel

Pentrex
*Eastern Kentucky Coal

Pelts Express
*C&NWs Iron Ore Route
*Duluth, Missabe & Iron Range Vol 1
*Duluth, Missabe & Iron Range Vol 2
*Lake Superior & Ishpeming Vol 1
*Lake Superior & Ishpeming Vol 2
*Bessemer & Lake Erie
*LTV Ore Lines
*Missabe T-Birds
*Missabe Rails
*Missabe Winter Vol 1
*Missabe Winter Vol 2
*NorthShore Mining Railroad
*Ohio Rails and the Wheeling & Lake Erie
*Railroads & Ships of U.S. Steel
*Taconite Trains of Minnesota Vol 1
*Taconite Trains of Minnesota Vol 2
*Birmingham Southern
*Elgin Joliet & Eastern
*Tribute to the Erie Mining Ore Lines
*Twin Ports Trackside Vol 1 Duluth Minnesota
*Twin Ports Trackside Vol 2 Superior Wisconsin

Prairie Works
*Hot Metal
* Union Railroad
* On the Great Lakes
* Lake Superior Iron
* Missabe Retrospective
* Duluth, Missabe & Iron Range Steam Power
* Duluth, Missabe & Iron Range Depots & Structures
* Taconite Haulers
*USS Duluth Works - Photo Video
*Super detailing a Walthers Blast Furnace Part 1
*Super detailing a Walthers Blast Furnace Part 2

Model Railroader's Dream - Plan - Build
* Railroads and Steel

Videotrain.com
*The Union Railroad

Any steel mill related videos that should be included on this list please send information to don_csx@hotmail.com

Steel Mill Related Books

*Morning Sun Books
By Stephen Timko
Steel Mill Railroads in Color Vol #1
Steel Mill Railroads in Color Vol #2
Steel Mill Railroads in Color Vol #3
Steel Mill Railroads in Color Vol #4
Steel Mill Railroads in Color Vol #5
Steel Mill Railroads in Color Vol #6
Steel Mill Railroads in Color Vol #7
Appalachian Coal Mines and Railroad Vol#1
Appalachian Coal Mines and Railroad Vol#2
Appalachian Coal Mines and Railroad Vol#3
Industrial Railroading Vol#1
Industrial Railroading Vol#1

Steel Mill Railroad Facilities and Equipment (eBook)

By Robert Wilt
Bethlehem Steel Company Vol #1, Obtaining – Transporting Raw Material, and Making Iron
Bethlehem Steel Company Vol #2 Making Steel, Finished Product Handling, and the Final Years

By David C. Schauer
LS&I Vol #1
LS&I Vol #2

By Richard C. Borkowski Jr.
Union Railroad In Color

By Kurt Reisweber & Brad Esposito
Pittsburg & Shawmut

*Model Railroader
By Bernard Kempinski
The Model Railroader's Guild to Steel Mill

*The Railroad Press
By Nevin Sterling Yeakel
Bethlehem Steel

*Plastruct
By Dean Freytag
The Cyclopedia of Industrial Modeling

*Walthers
By Dean Freytag
The History of Making and Modeling of Steel

Any steel mill related book that should be included on this list please send information to don_csx@hotmail.com

Steel Mill Related Websites

Groups
*Steel Mill Modelers Special Interest Group
http://www.smmsig.org/

Facebook:
*Bessemer Subdivision
https://www.facebook.com/groups/787429424621662/?fref=nf
*Bessemer and Lake Erie Railroad Sightings Page
https://www.facebook.com/groups/1029716723816394/
*Birmingham Southern-Fairfield Southern
https://www.facebook.com/groups/337021349697833/
*BSRR/FSRR
https://www.facebook.com/groups/471524686212350/
*Coal Critter of Kentucky
https://www.facebook.com/groups/446906699000395/
*Harrisburg Terminal Railroad
https://www.facebook.com/Harrisburg-Terminal-Railroad-271356453384157/
*Chicago Area Steel Mills
https://www.facebook.com/groups/1679894998965838/
*Hot Metal Trains
https://www.facebook.com/groups/1143908999010704/
*Iron Ore Modeling
https://www.facebook.com/groups/559496990829520/
*J&L Narrow Gauge Railroad
https://www.facebook.com/groups/rolling.ingot/
*Munhall, Bessemer and Port Perry
https://www.facebook.com/munhallbessemerandportperry/
*New Boston Steel Mill and Coke Plant
https://www.facebook.com/groups/349284928484151/
*Timber River Railway
https://www.facebook.com/groups/1591376621172524/
*The Splitrock Mining Company layout
https://www.facebook.com/The-Splitrock-Mining-Company-layout-326394957565987/
*Steel Mill Modelers
https://www.facebook.com/SteelMillModelers/
*Steel Mill Modeling
https://www.facebook.com/groups/708840849171343/
*Steel Mill Pictorial
https://www.facebook.com/groups/1561038727264008/
*U.S. Steel Duluth Works
https://www.facebook.com/groups/101591233225098/
*Youngstown Steel Heritage
https://www.facebook.com/SteelHeritage/

Photographs
*2007 Steel Mill Modelers meet
http://www.pbase.com/jtunnel/2007_steel_modelers_meet&page=1
*Arthur's Albums and Images
http://www.rmweb.co.uk/community/index.php?/gallery/member/6861-arthur/
*Birmingham Rails
http://www.bhamrails.info/
*Rick Rowlands
https://www.flickr.com/photos/33523379@N03/sets/
*The Rust Jungle
http://www.therustjungle.com/

Layouts:
*Acme Steel Riverdale BOF & Chicago BF Modeled in HO scale(1/87**)**
http://www.trainweb.org/chicagosteel/index.htm
*Bethlehem Steel Layout
http://www.brokenbushandroundtop.com/bethlehemsteel/
*Columbia River Steel Corporation
http://www.prairie-works.com/crsc.html
*Dave Scale Modeling
http://daveayers.com/Modeling/
*DK Recycling
http://www.frankshuette.de/
*Forsten Online
http://www.stahlbahn.de/index.php
*Harrisburg Terminal Railroad
https://www.facebook.com/Harrisburg-Terminal-Railroad-271356453384157/
*Pittsburgh and Western Railroad - Paul Lapointe
http://www.coaldivision.org/pittsburgh_and_western.html
*Pittsburgh, Youngstown & Ashtabula RR
http://www.pyamodelrailroad.com/
*Stahlbahn
http://www.stahlbahn.de/index.php
*Republic of Train World
http://trainworldcity.webs.com/apps/blog/show/43914314-the-trainworld-city-steel-works-and-duluth-works-

Blogs
*KV&O and D&D Mining & Steel
http://doncsx.blogspot.com/
*Musser Steel Mill
http://mussersteelmill.blogspot.com/

Hobby Shops
*Industrial Model Shop
http://industrialmodelshop.com/
*Joswood
http://lasercut-shop.de/Joswood-Ltd
*KenRay Models
https://kenraymodels.com/
*State Tool & Die
http://www.statetoolanddie.com/

Yahoo Groups
*Harrisburg Terminal Railroad
https://groups.yahoo.com/neo/groups/htrrco/info
*Steel
https://groups.yahoo.com/neo/groups/steel/info

Manufactures
*Adair Shops
http://adairshops.net/index.php
*FireCat Designs
http://www.firecatdesigns.com/home.html
*Plastruct
https://plastruct.com/
*State Tool & Die
http://www.statetoolanddie.com/
*Steel Mill Modelers Supply
https://www.facebook.com/steelmodelerssupply/

Museums
*Youngstown Steel Heritage
http://www.todengine.org/

Podcast
*A Modelers Life
https://www.amodelerslife.com/
*Model Railroad Hobbyist podcast
http://model-railroad-hobbyist.com/podcast/episodes
*The Roundhouse
http://theroundhousepodcast.com/

Steel Mill Related Picture CDs

Prairie Works
* Minnesota Iron & Steel
* Heavy Industry Postcards
* Coper & Nickel
* Tod Engine Project

Any steel mill related website that should be included on this list please send information to don_csx@hotmail.com