No. 157, September/October 2018 US $5.95
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STEAM IN THE GARDEN

Building The Kittatinny Mountain Railroad

- Rebirth of the RGS #74
- Erie Triplex - Part Four
- Locomotive Review - Accucraft C-25 Coal

... and lots more!

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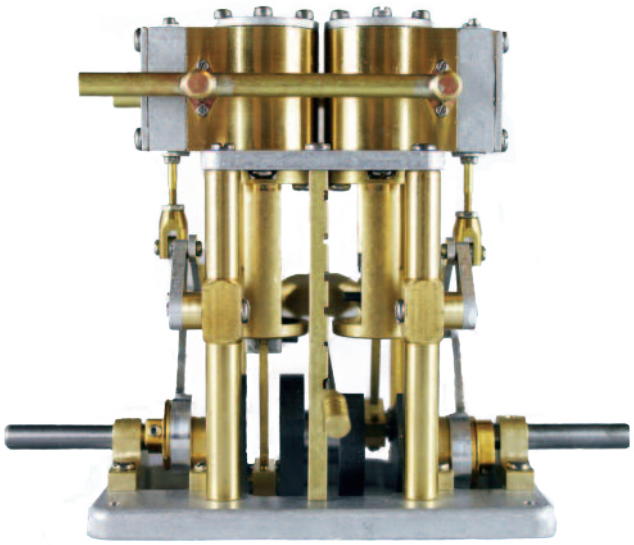
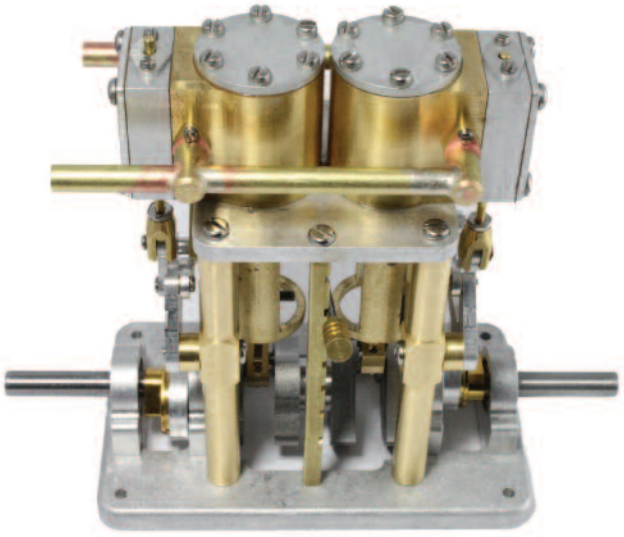


TVR1A

Ready to assemble steam engine kit: $245
Fully Assembled and Tested: $350
Includes all hardware
Double acting, twin cylinder
Hackworth reversing gear
Includes full-color assembly manual
Dimensions:
Base: 3.000" x 1.844"
Crankshaft end-to-end: 4.344"
Height: 3.375"
Weight: 327 g



TVR1ABB

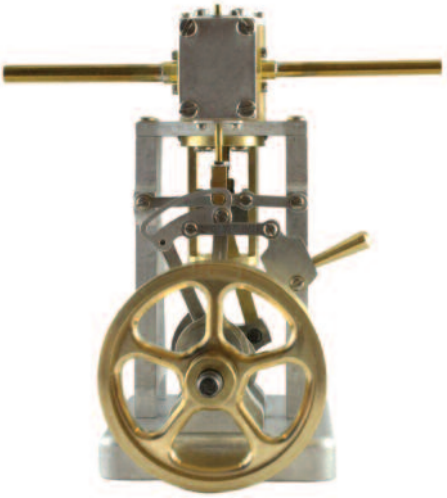
Ready to assemble steam engine kit: $295
Fully assembled and tested: $400
Includes all hardware
SAME AS TVR1A but with shielded ball bearings
Includes full-color assembly manual
Dimensions: Same as TVR1A
Weight: 323 g

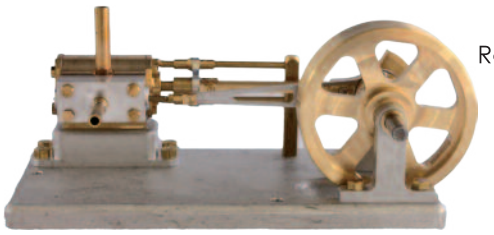
Flywheels for TVR1A / TVR1ABB

MFLY: $20
1 3/8" DIA
(Solid Marine)

BFLY1: $25
1 3/4" DIA (5 Spoke)

BFLY2: $30
1 3/4" DIA (6 Spoke)





HM1

Ready to assemble steam engine kit: $95
Fully Assembled and Tested: $145
Kit includes all hardware
.344" bore, .500" stroke
Double acting, single cylinder
Includes full-color assembly manual

VR1A

Ready to assemble steam engine kit: $119
Fully Assembled and Tested: $175
Includes all hardware
1/2" bore, 1/2" stroke
Double acting, single cylinder
Reversing lever
Includes full-color assembly manual

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STEAM IN THE GARDEN

Gather friends, while we inquire,
into trains, propelled by fire ...

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http://www.steamup.com/

Cover: Life on the Kittatinney Railroad is pretty laid back. See the article starting on page 34 for more. **Photo by Shawn Viggiano**

Also inside:

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LATEST WAYBILL

Accucraft Trains, Union City, California - Accucraft Trains will be releasing a VERY limited final production of their gauge one 1:32 H8 Allegheny in butane fired live steam or electric, delivering in September 2018.

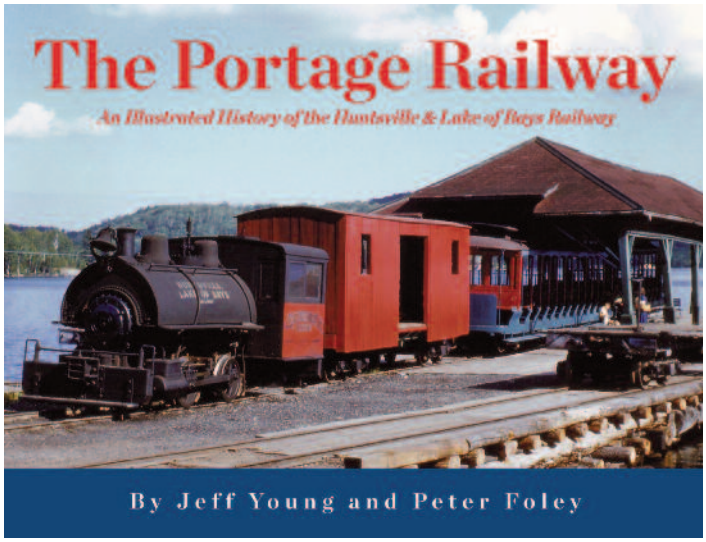
Because of this low supply, they will require a $1000 nonrefundable deposit. When reserving, you must specify your choice of live steam butane fired or electric powered and which lettering.

For ordering information visit their online store at: https://www.accucraftestore.com for prices, lettering and product codes. You can call their office at 510-324-3399 to pay by credit card or PayPal.

Credit Valley Railway Company, Mississauga, Ontario, Canada - Live Steamers Jeff Young and Peter Foley have completed their investigation and research on the Huntsville & Lake of Bays Railway, and present their newly published book "*The Portage Railway*."

Promoted as "the smallest commercially operating railway in the world", the Huntsville & Lake of Bays Railway served as a vital link between two steamboat routes carrying tourists and supplies to the Lake of Bays, plus tanbark and cut lumber to Penninsula Lake (and on to Huntsville). The railway's other unique claim to fame was that it was completely re-gauged during its lifetime to accomodate replacement of the locomotive fleet.

This new book represents the culmination of years of painstaking research. In 204 pages, it tells the story of the Portage Railway. Its large format, 12-by-9-inch landscape presentation features more than 300 photographs, of which 85 percent are previously unpublished. The photos and text are highlighted by twenty double-gatefold 9-inch

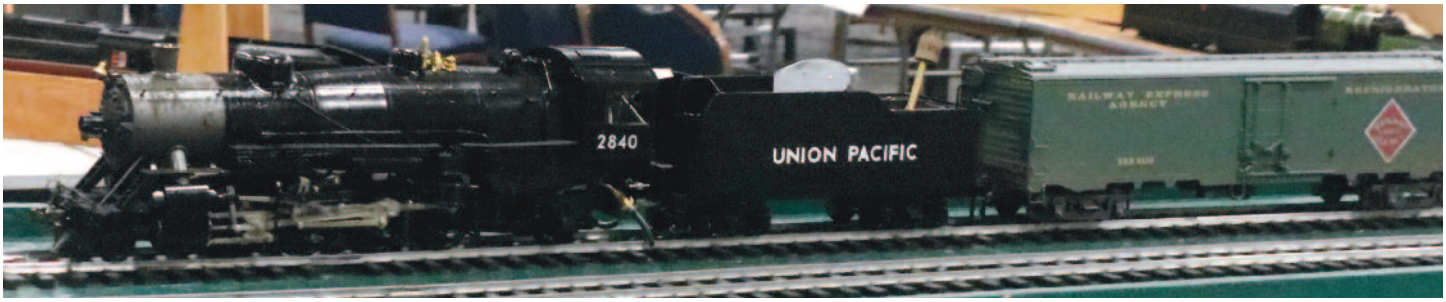


by 18.5-inch scale plans and drawings, plus eight detailed maps.

Available from:
Credit Valley Railway Company, 2900 Argentia Road, Unit 24, Mississauga, Ontario, Canada, L5N 7X9. Online at *www.cvrco.com*.

Peter Foley mans the transit as Jeff Young sets the stick out in the field surveying the original Huntsville & Lake of Bays Railway roadbed.

Aster Hobby and Accucraft Trains - Aster Hobby and Accucraft Trains have announced their second collaboration. Coming this August 2018, the two companies will be releasing an improved version of Aster's USRA Light Mikado 2-8-2. The original



Aster/Accucraft Mikado pilot model as seen at the National Summer Steamup 2018, Sacramento, California.

Photo by Carla Brand-Breitner

Aster Light Mikado was produced in 1999 and was offered in a basic version with available upgrades. See the list of new features below that have been added to this new updated design. Production quantity will be limited to 60 units.

Directly following the Light Mikado, they will introduce the brand new Aster USRA Heavy Mikado 2-8-2, with delivery planned for November 2018. This model will share many of the same improved features as the Light Mikado but with the larger boiler casing, larger smokebox and cab of the Heavy Mikado. Production quantity will be limited to 160 units.

New Features of the Aster Accucraft Light Mikado include:

- Cast-iron driver wheels
- Fully equalized chassis
- Stainless steel machined driving rods
- Axle pump with additional 20 percent capacity from previous option
- Washout plug for the water gauge
- Newly designed tender
- Kingston valve in water tank
- Increased water capacity (450cc)
- ncreased fuel capacity (300cc)
- Detachable fuel tank
- Detachable roof plus many newly designed aesthetic details added around smokebox, front buffer, and boiler case.

Available Light Mikado Roadnames:
New York Central Railroad, Union Pacific Railroad, Baltimore & Ohio Railroad

Heavy Mikado Roadnames:
Undecorated Black, Erie Railroad, CB&Q Railroad (Burlington Route), Milwaukee Road, Southern Railway (Distribution of roadnames subject to change). All models are alcohol fueled

Planned Pricing:
Light Mikado KIT: $3900, RTR: $5000
Heavy Mikado KIT: $4400, RTR: $5500
Reservations are being taken by Accucraft's Union City Office. Phone: 510-324-3399 or email sales@accucraft.com to reserve.

Outeniqua Transport Museum in George, South Africa, and the South African Large Scale Model Railway Group (SALSMRG) - In an endeavour to promote the larger scales and gauges of the hobby and raise the profile of the Outeniqua Transport Museum in George, the South African Large Scale Model Railway Group (SALSMRG), in conjunction with the Eden Lions and the Outeniqua Railway Society, is hosting a five-day exhibition in the museum premises in December. The exhibition is loosely based on the annual Diamondhead Steamup event held in the USA.

Two layouts will be available enabling Gauge 1/G scale and 16mm scale live steam and also electrically powered (DC, DCC and battery) locos to be run on 45mm and 32mm track.

The exhibition will commence on Friday, December 14th and run to Tuesday, December 18th, 2018. Note the 17th is a public holiday but the museum will be open that day and also Sunday the 16th.

Normal museum opening hours are 8:00am until 5:00pm, but for logistical reasons the layouts

(continued on page 43)

Workshop Project

Rebirth of the Rio Grande Southern #74

Text, Photos, and Drawings by Rob Lenicheck

Every scratchbuilding project starts with a seed. The prototypical seed for this build, Engine #30, resided in a downtown Boulder, CO park for many years while I lived there. I always thought it was a cool engine but it wasn't until years later, after I got into live steam and had a fairly complete machine shop, that I had any thoughts of building it.

Engine #30 began life in 1898, a product of the Brooks locomotive works of Dunkirk, NY. It was originally built for the 36-inch-gauge Colorado and Northwestern which ran to the west of Boulder. The engine design itself pushed the limits of weight and boiler size for the times and, as a result of having such a large diameter boiler on an inside frame, the cylinder steam chests were slanted outward thirteen degrees, presumably to assist with the valve maintenance. Unfortunately, this design caused major valve lubrication headaches for the railroads which owned and ran this engine; the Denver, Boulder and Western, the Colorado and Southern (which changed the number of the engine to #74), and, finally, the Rio Grande Southern.

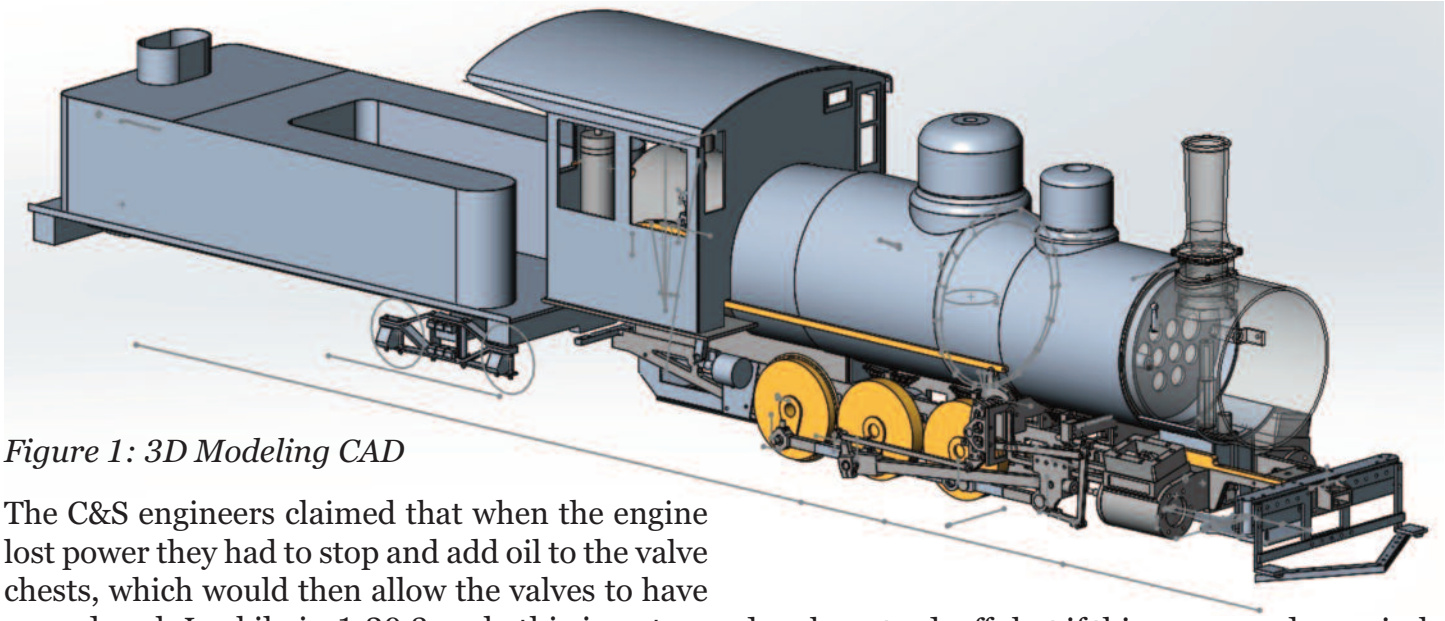


Figure 1: 3D Modeling CAD

The C&S engineers claimed that when the engine lost power they had to stop and add oil to the valve chests, which would then allow the valves to have a good seal. Luckily in 1:20.3 scale this is not an issue.

I much prefer to take the time to originate the "models" of the various components which make up a locomotive by drawing them up in 3D CAD (I use Solidworks). For me it's like painting a house: it's 80 percent prep and 20 percent actual painting (even though I get very impatient during the "prep" stage). When I do this I know all the pieces will fit together and I can plan ahead for holes and threads which I won't be able to reach later.

So, the barebones assembly is shown in the CAD drawing in **Figure 1** .

Having the 3D model allows one to take some shortcuts. I had the frames water-jet cut by a vendor which I found online. It was a simple matter of sending him a correctly formatted file attached to an email note, which he then used to cut the frames (**Photo 1**).

The brass pieces seen in this shot are part of the active suspension for the drivers, the equalization. I don't use any driver springs in my builds. This does have tradeoffs but if things are made precisely enough an equalized frame assures that all the drivers are contacting the rail at the same time. Thus, more track adhesion and better pulling power.

Along with the frame planning and design came the thoughts about the drivers. Despite going to the Colorado RR Museum and taking photos of the prototype, I think I missed the boat on the number of spokes – but who's counting from thirty feet away, right? Since I couldn't find an appropriate casting from any supplier, I drew up a 3D model and sent it off to the folks at Walsall in the UK. They very graciously offered to cast them up and turn each to size for a very reasonable price if they could add the casting to their product line. Easy decision!

This prototype was my first experience with building a Walschaert valve gear. It was designed using the amazing Dockstader software which I've talked about before. This is free and available on the Web at:
http://www.billp.org/Dockstader/ValveGear.html

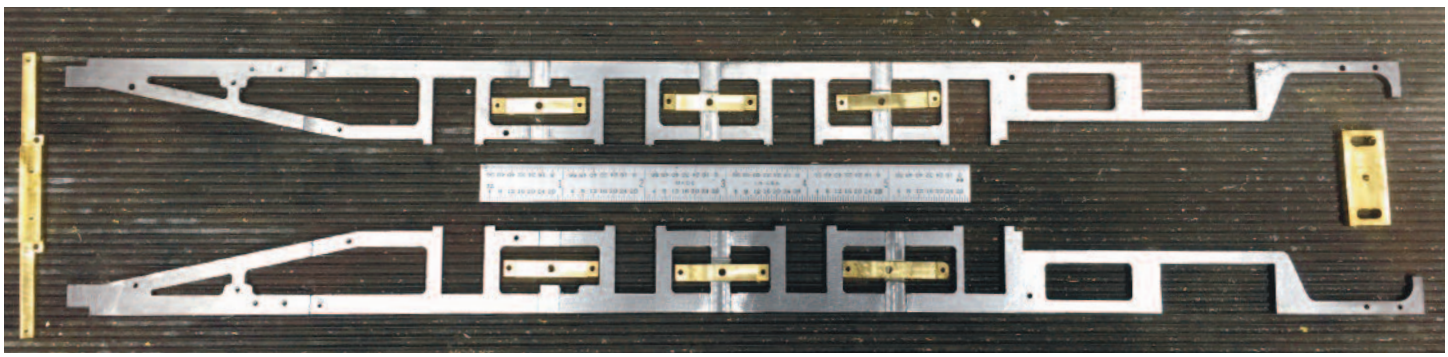


Photo 1: Water-jet cut frames

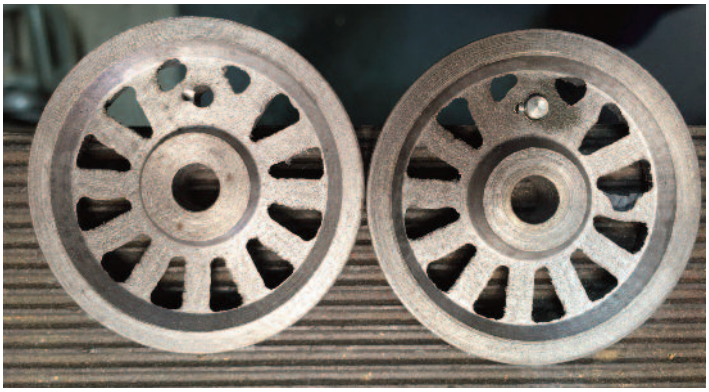


Photo 2 - Driver crankpin set in place.

While the build of the valve gear was not particularly difficult, I was concerned that the eccentric arm, if given enough torque, could force the rotation of the main driver crankpin. This, in turn, would cause the valve timing to change.

To prevent this situation from happening, I needed to come up with a method to prevent the main driver crankpin from rotating. What I came up with is shown in **Photo 2**. A 1/16-inch pin was inserted through the end of the 3/32-inch diameter crankpin. It, in turn, is located in a slot machined into the back of the driver. The pin was then secured in place in the driver with Loctite.

Since I despise having to make a jig for quartering the drivers I found a method from John Baguley on the Web which employed the use of a lathe for doing this. While being held on centers in the lathe, the idea is to use a machinists square against one driver crankpin in the vertical position and a horizontal stop against the other crankpin. The horizontal stop must be machined to the height of the centerline of the lathe minus one-half the diameter of the driver pin. As Baguley states "Therefore, when the axle was mounted between the two centres and one crankpin was against the edge of the square at the headstock end and the other resting on the height gauge, the crankpins would be at 90 degrees (or near enough!) The actual angle is not critical but must be the same for all the wheel sets." See **Photo 3.**

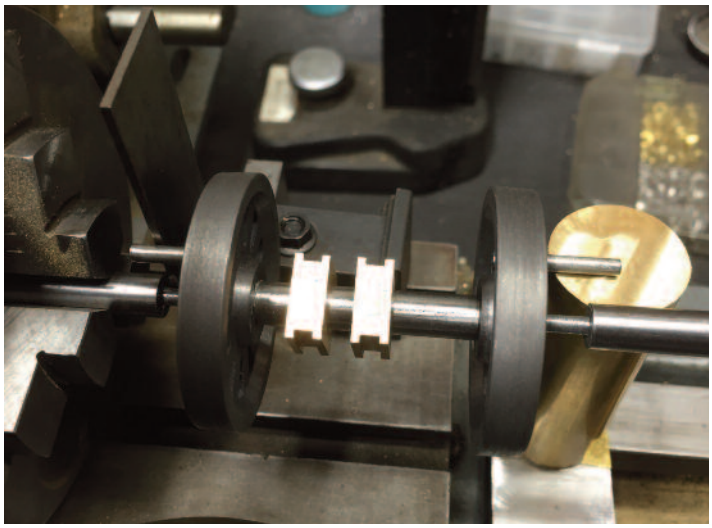


Photo 3 - Quartering the drivers using a lathe setup.

I have become quite enamored with 3D printing and have used it when no alternative was available (or if I could save substantial amounts of time.) 3D Stainless Steel printing was used for the stack and tender truck sideframes on this model. There are several companies out there who are printing in Stainless Steel, which I think is necessary when used in close proximity to a hot steam engine. One of the most astounding developments in SS printing resolution was perfected by a company in Belgium called iMaterialise. They use a laser-based technology that uses powdered metals to make the part. The astounding part about this is how precisely the part can be made. **Photo 4** shows a prototype injector which was made by them. As a point of reference, the small handle at the top is about .020-inch in diameter.

If you haven't surmised so by now, this engine is a coal-burner. The boiler design follows all of the empirical design criterion in the K.N. Harris book *"Model Boilers and Boilermaking"*. One of the main challenges of this boiler is that the firebox sits between the drivers and ends up with the dimensions of approximately 4 ½-inches by a little more than 0.9-inch. Again, the prototype was measured

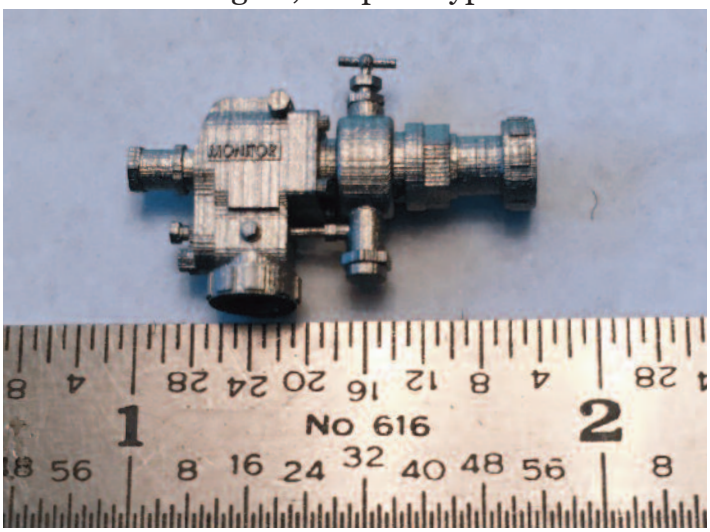


Photo 4: 3D printing in Stainless Steel provides a high quality part for plumbing details.

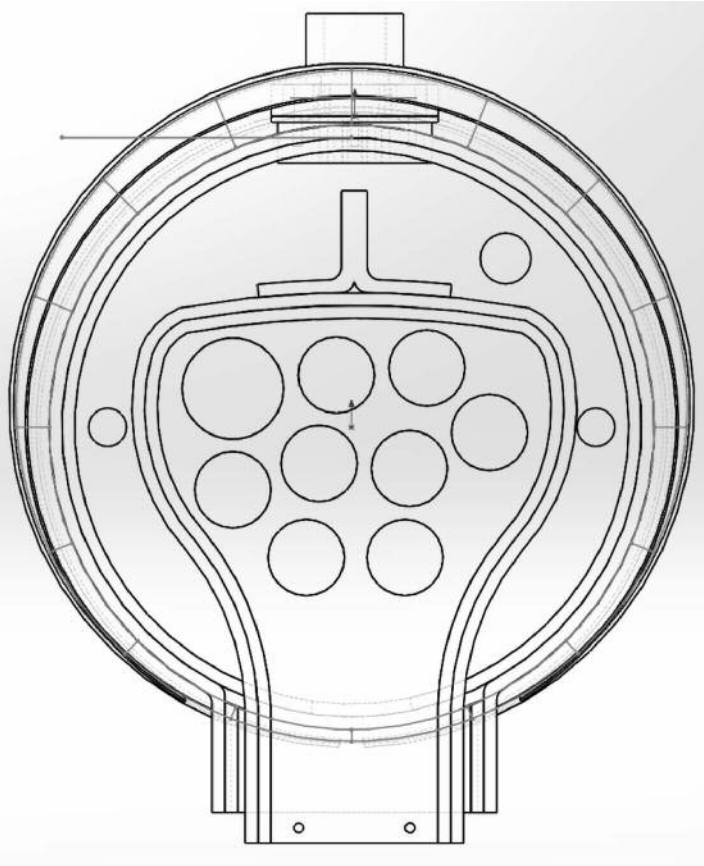


Figure 2 - View of the boiler layout.

for this.

It's amazing to me to think that the guys who fired the real thing were able to throw coal all the way into the end of the firebox, having experienced this frustrating experience myself on the real thing. The boiler is a hefty three inches in diameter, with eight three-eighth-inch tubes and one half-inch flue for the superheater (**Figure 2**). By far the most difficult part of the construction of this boiler was the firebox area and the crown sheet. The back head is dry so much care needed to be taken to make a good solder joint. Speaking of which, I heavily favor mechanically fastening the parts together prior to silver soldering. This method does not allow for the parts to move in subsequent soldering operations.

If you follow the coal boiler design principles in the Harris book, they're guaranteed to provide a boiler which will work. Although there are some other design parameters which must be dealt with, this boiler appears to work and draft quite well. It was run successfully several times at Staver's Spring Steamup in April this year.

I have found that, like the Accucraft C-16 I converted to coal a few years ago, this engine fires best on coal which has been screened down to about quarter-inch size. And if after screening I run out of coal that size, well, it's time for a hammer and a rolled up t- shirt. No frustrations here!

The engine is equipped with a quarter-inch diameter axle pump and a three-eighth-inch throw which allows for boiler water make up when necessary. The water lines to and from the axle pump on the model simulate the prototypical injector lines coming from the tender. (**Photos 5 & 6**).

In the smokebox, the blower line is capped with a simple 0.030-inch diameter hole which gives a great draft when it's used. The fact that the blower can't point up concentrically into the stack doesn't matter. I did take care to make sure that the distance from the top of the blast pipe conforms to the

Photo 5 - Check-valve plumbing and steam condenser details

Photo 6 - The right side of the locomotive with the plumbing details in place and the tender water feed line.

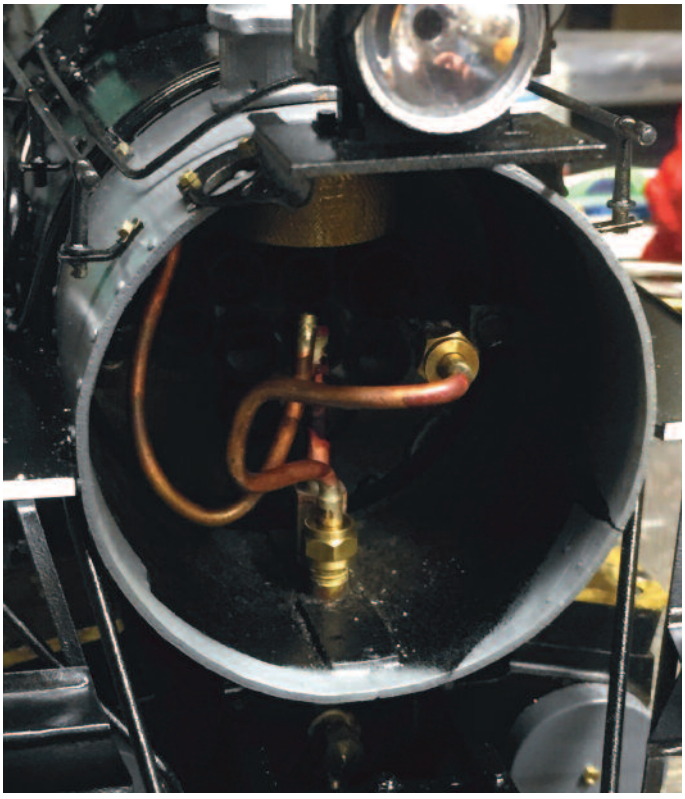


Photo 7 - View of the smokebox showing the routing of the blast nozzle (left) and the steam line past superheater.

3:1 rule. This *does* matter.
(**Photo 7**).

The tender tank was made from 0.025-inch brass which mates with the tender frame (**Photo 8**). The back of the tender platform comes off for easy water filling and the tank lid lifts to expose the tender pump when needed (**Photo 9**).

Photo 8 - Tender tank (left) and coal bunker (right) ready to be mated to form the completed tender.

The final cap to this engine is the number plate on the smokebox made by Robert Dustin. (**Photo 10**).

Done! Onward to the next project.

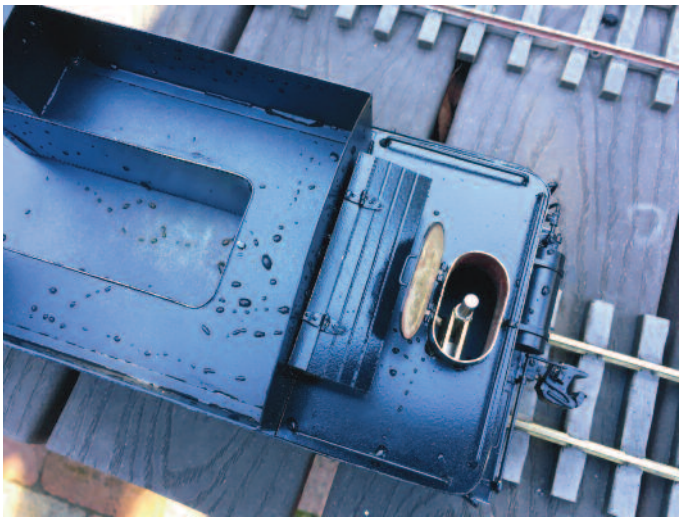


Photo 9 - Completed tender showing the access to the hand pump.

Photo 10 - A number plate by Ronald Dustin caps off the project nicely.

The completed locomotive, ready for it's first steaming.

North America 16mm Association 2018 Annual Gathering

Text by Rob Kuhlman and Jeff Young

Photos As Noted

The scenic scale railroad hobby has evolved differently in North America than it did in Europe. Because there are fewer of us and we live farther apart, when we attend a steamup we each bring what we're individually interested in. Consequently one finds a heterogeneous lineup of antique tinplate toy trains, early SM32 British narrow gauge, 1:20 North American narrow gauge, and 1:32/1:30 mainline trains in both North American and European outline — all running together. Diversity is good; that's how we learn. But as the 40th anniversary of the Association of 16mm Narrow Gauge Modellers was approaching, several of us decided that we wanted to create an event celebrating the heritage of this small niche in the larger hobby by gathering and running, displaying, talking, and learning about 16mm scale modeling in both 32mm and 45mm gauges. The first Annual Gathering was held last October in Columbus, Ohio, and we all had fun so we decided to do it again.

The second Annual Gathering was held at two venues over four days at the end of May in southeastern Pennsylvania. On the Friday and

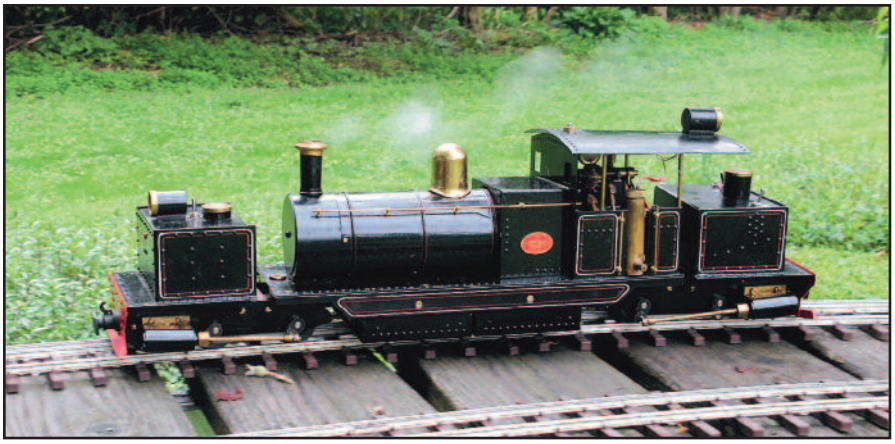
An overview of the author's railway. Rob hosted the group at his railway in addition to the meet-up at the Pennsylvania Live Steamers track site in Rahns, Pennsylvania.

Photo by Nathan Ashby-Kuhlman

Top Photo: *Rob Kuhlman's Americanized Roundhouse Billy pushes mineral wagons while Peter Foley, background, services his Katie II.* *Photo by Nathan Ashby-Kuhlman*

Lower Left: *Peter Angus-built Brigham, beloved by Ron Brown, rebuilt by Mike McCormack and Peter Foley, now owned by Peter.* *R.K. Photo*

Lower Right: *Vintage Hyde Out Mountain Shay, built by Jerry Hyde, and owned by Gary Francke.* *R.K. Photo*

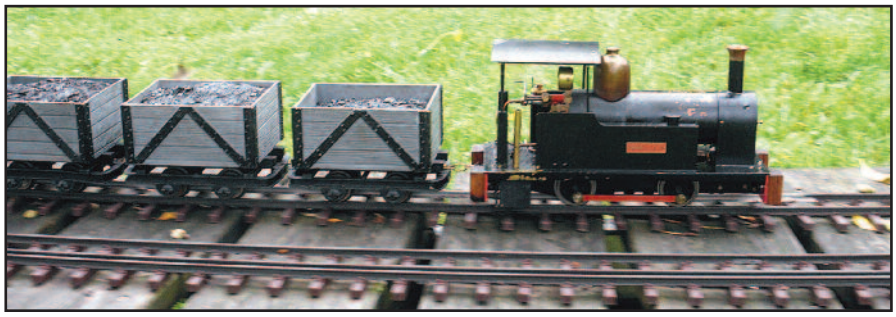


Chuck Lawrence's Locobox Garratt

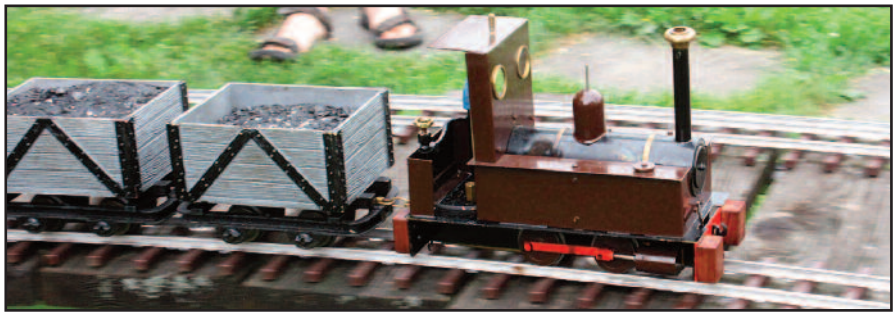
R.K. Photo

Gary Francke's Aster Kiso Baldwin

R.K. Photo



Peter Foley's vintage 'What an Archangel Brick should have been' built by Steve Bell *R.K. Photo*



Peter Foley's Cuckoo's Nest Katie II

R.K. Photo

Saturday of the U.S. Memorial Day holiday weekend we gathered at the campus of the Pennsylvania Live Steamers. PLS is one of the pioneer live-steam model engineering clubs in the U.S., having recently celebrated its 70th anniversary. Its extensive campus features thousands of feet of ground level track in a variety of gauges to enable 'hernia scale' steamers to run. The PLS Gauge One line, recently rebuilt in double tracked 45mm gauge, was supplemented for the event by two portable railways, generously provided by Mike Moore, featuring double tracked Gauge One and Gauge 0, so the waits for track time were quite brief. The weather both days was remarkably pleasant, in fact so pleasant that we were joined on Saturday by a rather large snapping turtle who spent most of the day laying her eggs about 15 feet from one of Mike's railways.

On the Sunday and Monday of the event participants gathered at the home railway of Rob Kuhlman. The weather forecasts for both days were foreboding, but the weather gods looked upon our group favorably and kept the running intervals essentially rain free. We used Phoenixville, Pennsylvania as the residential center for the four days with a number of bistros, coffee bars, and brew pubs within a short walk of the hotel; Phoenixville was a 20 minute drive from both railway venues.

Participants brought a wide variety of heritage and contemporary, humble as well as elegant SM32/45 and 7/8th-inch scale locomotives; surprisingly there was very little redundancy – only three Roundhouse Jacks (one coal fired), two Lady Annes, two Billys, and two home-brew locos based upon the BAGRS design – everything else was unique. Of particular note was the large

Ron Vertrees' Leek and Manifold train, including a standard gauge transporter wagon carrying a milk tanker. J.Y. Photo

number of heritage locomotives from long-gone manufacturers. Making a cameo run was 'Brigham', a Peter Angus overtype locomotive once owned and cherished by SitG founder Ron Brown, rebuilt by Mike McCormack and Peter Foley, and now owned by Peter.

Of the approximately 4000 total members of the Association, fewer than 100 live in North America; we had over 25% of those members register for our event (plus one individual who flew all the way from Australia!), and we picked up a few new members as well, so we regard these Annual Gatherings as a great success and plan to continue them into the future.

Tom Toth's Roundhouse Katie approaches Will Lindley's Roundhouse Lady Anne. J.Y. Photo

Next year's Annual Gathering will be based in Hamilton, Ontario (west of Toronto) at the end of May 2019. Look to the Annual Gathering website: *http://www.northamerican16mmmodellers.org/* and the SitG Timetable for informational updates.

Bruce Saylor's ride-on locomotive passing Jeff Young's coal-fired Shawe Fowler. J.Y. Photo

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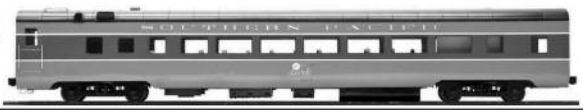

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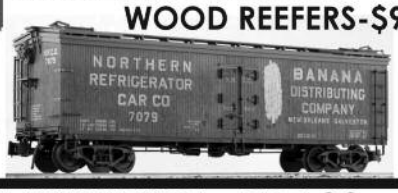

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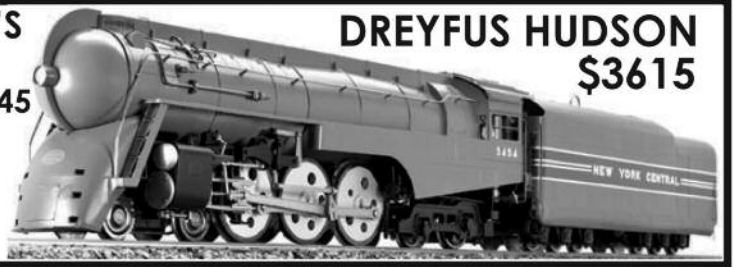

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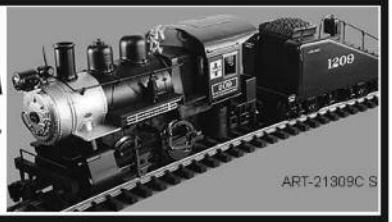

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Building The Mighty Erie

Text & Construction Photos by Bill Allen

The Triplex had a wagon-top boiler with only a slight rise in the rear and no change on the sides. Adding the extra capacity to the boiler was not necessary in the model but the boiler wrap needed to be done to be aesthetically correct.

Erie Triplex Series

Having built a compound Heisler, Bill Allen decided to undertake the multi-compound cylinder, triple-framed Erie Triplex, hoping to achieve better results than the prototype! This six-part series includes:

Part 1 - Planning Three Chassis
Part 2 - Front Deck, Pilot, & Trucks
Part 3 - Making the Boiler
➲ Part 4 - Smokebox & Boiler Shell
Part 5 - Domes & Fittings
Part 6 - Finishing

SMOKEBOX

The tube part of the smokebox is made in similar fashion to the boiler, by cutting down a piece of pipe and silver soldering it together. It didn't need the reinforcement strip at the seam as there is no pressure here.

The front is made from a piece of quarter-inch brass bar. A compass is used to scribe the outline. First I center punch an indention for the compass and then use that to drill a 5 mm hole for my lathe arbor. I cut proud of the line on the band saw and then turn to size on the lathe. I turn a recess on the inside where it will fit into the smokebox and then turn it around on the arbor and turn the profile with a bull nose bit (**See Photo 4-1**).

The rivet holes are scribed off with the compass and drilled to 0.040-inch (**Photo 4-2**). Two small right angle brackets (not shown) are silver soldered to the front and it is bolted on with 00-90 bolts which will look like rivets when it is painted (**Photo 4-3**).

The bottom of the box was cut off on the prototype for clearance of the front chassis, so I did the same. The large exhaust access hole seen in **Photo 4-4** is to accommodate the amount of smokebox air circulation the ceramic burner requires.

I was lucky to have a Trackside Detail door that matched the original. I did have to do a little adjusting to the two hinges but it was a perfect fit (**Photo 4-5**).

Triplex Part Four

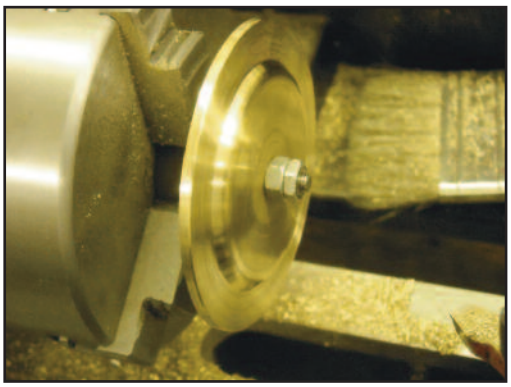

Photo 4-1

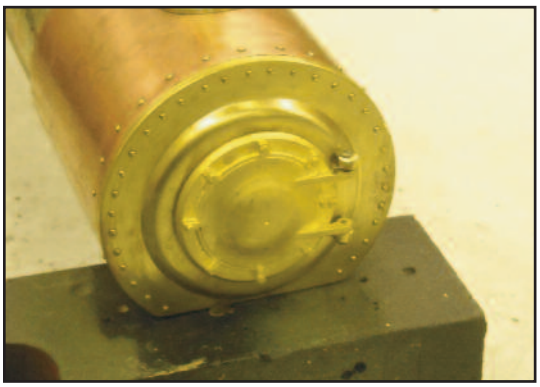

Photo 4-2

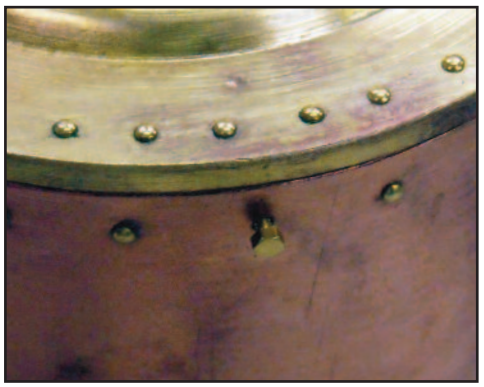

Photo 4-3

MOUNTING

The boiler is mounted in three places. The center chassis attaches at the back of the boiler (the ceramic burner box) and at the center of the boiler above the front drivers. These two mounts are fixed and keep the boiler center chassis in line. The front of the boiler sets on a sliding mount on the center of the front chassis (**Photo 4-6**). This allows the front chassis to negotiate curves inde-

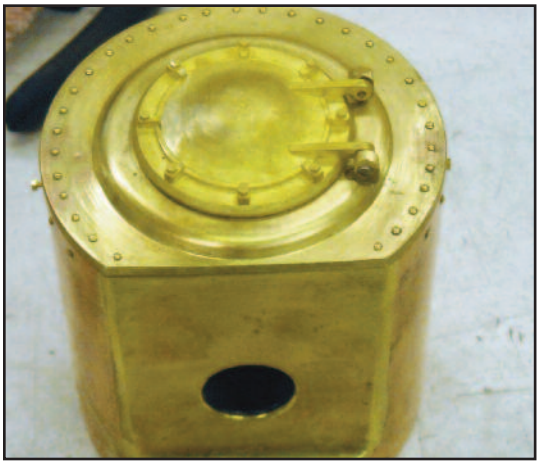

Photo 4-4

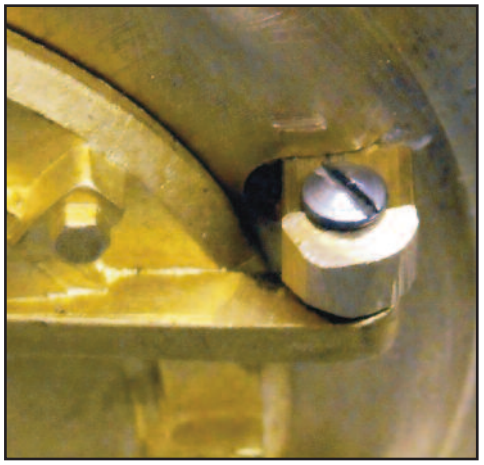

Photo 4-5

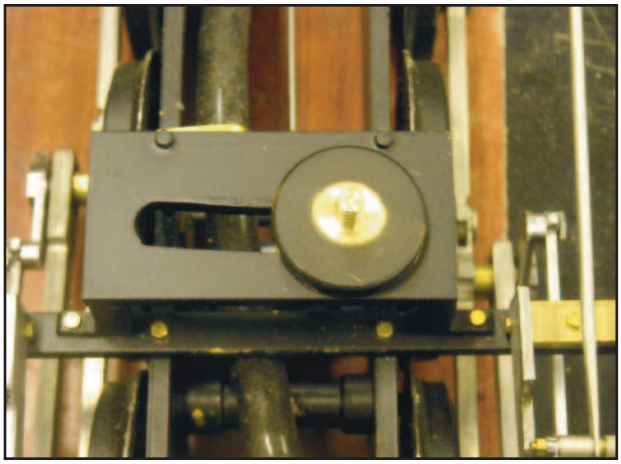

Photo 4-6

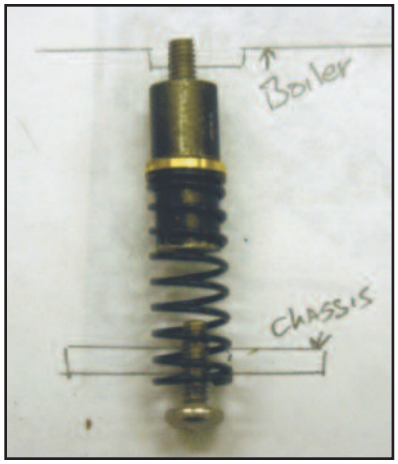

Photo 4-7

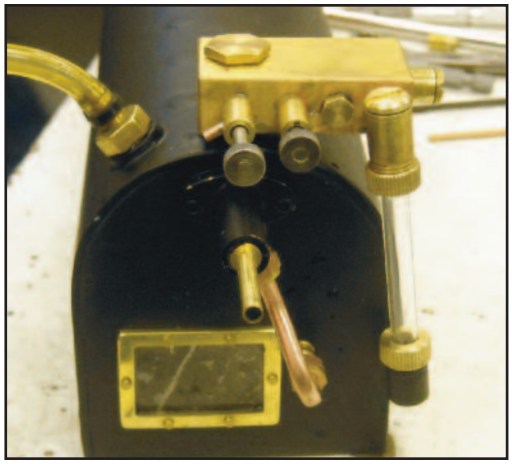

Photo 4-8

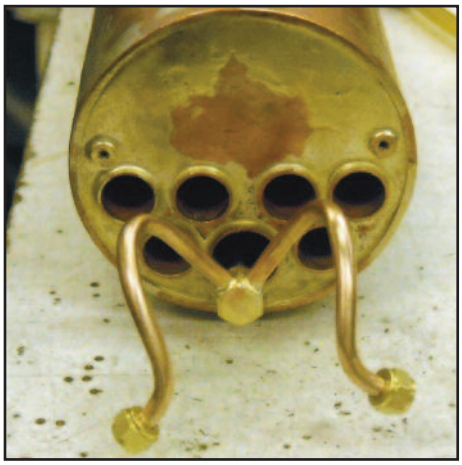

Photo 4-9

pendent of the boiler position.

Because this was the first working compound 1/32nd model of this engine, I needed to be able to adjust the weight between the front and center chassis, as I wasn't exactly sure how the torque would be distributed between the two. The front and rear mounts are fixed for vertical purposes and if I were to make the center mount fixed, the height would determine how much of the boiler weight would go on the front chassis. I decided to make the center mount spring loaded with an oversize spring which I could compress with a screw, thus lowering or raising the mount. This made the weight on the front adjustable and also had the advantage of making it easier to negotiate rough track. See **Photo 4-7.**

TUBING

In my opinion the diameter of the tubing used in many of our G scale models is too small. This doesn't affect slow running or pulling light loads but it does hinder pulling heavy loads at speed. An early Ruby with three-eighth-inch cylinders has 3mm tubing, while a Cab Forward with four five-eighth-inch cylinders has the same size dry pipe. This seems undersized to me. According to my friend Henner Meinhold, the flow-through differences of tubing can be calculated as the diameters to the fourth power so normalizing the 3mm tube as a factor of one we get the results shown in Table I.

It is interesting to note that although 3mm is only a few thousandth less than one-eighth-inch because of the wall thickness, the ID is 18 percent larger and the flow-through is almost double. Likewise, a 3/16-inch stainless tube with a 0.020-inch wall thickness, and an ID of 0.148 inch, has over 12 times the flow through as a 3mm tube. The longer the run the more resistance you will have.

Table I - Tubing size and flow rates.

TUBING SIZE	ID(mm)	POWER OF FOUR	NORMALIZED
3 mm	2	16	1
1/8 inch	2.36	31	2
5/32 inch	3.18	102	6
3/16 inch	3.75	199	12

Also in designing engines, special attention needs to be paid to the exhaust tubing. Because the exhaust pressure is normally one-third of the admission pressure, it takes a longer time to pass through the tubing, so larger tubes are advisable.

My plan was to get the largest piping possible to the cylinders. The tube from the steam dome to the throttle (dry pipe) needed to be 5/32-inch to be bent properly at the steam dome. The short tube from the throttle to the superheater was also 5/32-inch. See **Photo 4-8,** where you can also see the 6mm sight glass and the mini valves for the steam generator and tender water heater.

From there everything is a flow-through of 12 or higher. The stainless superheater is 3/16-inch which goes from the back head through the firebox and large flue to the smokebox, where it T's off to a 5/32-inch tube for each HP cylinder (**Photo 4-9**).

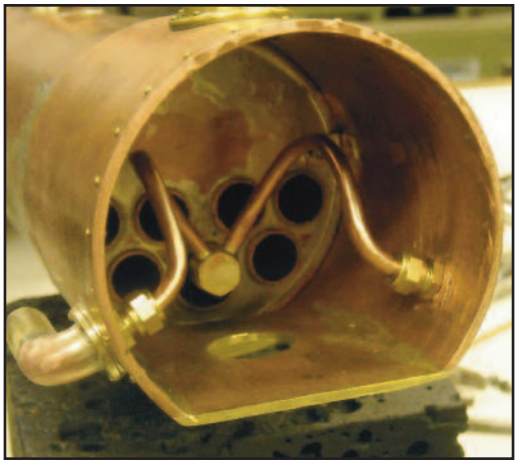

Photo 4-10

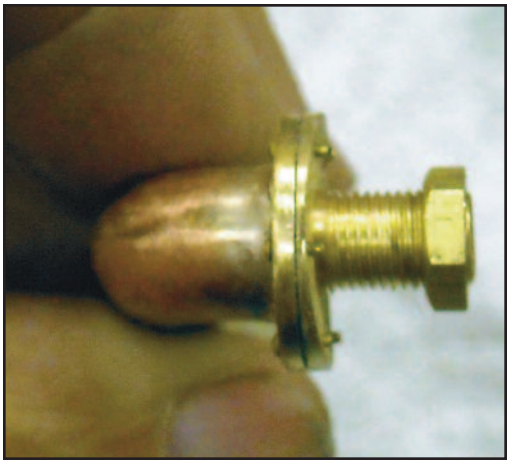

Photo 4-11

These tubes then go through the smokebox sides and along the side to the right and left cylinders per the prototype as shown in **Photo 4-10**.

Photo 4-11 shows the fitting used to go through the smokebox. The elbow is a three-eighth-inch refrigeration elbow with the bell-mouth cut off, which is then silver soldered to the flanged threaded stud. A curved washer matches the smokebox radius and rivets are soldered in that will position the fitting with holes drilled in the smokebox. A 5mm nut is then rounded off to mate on the inside of the box.

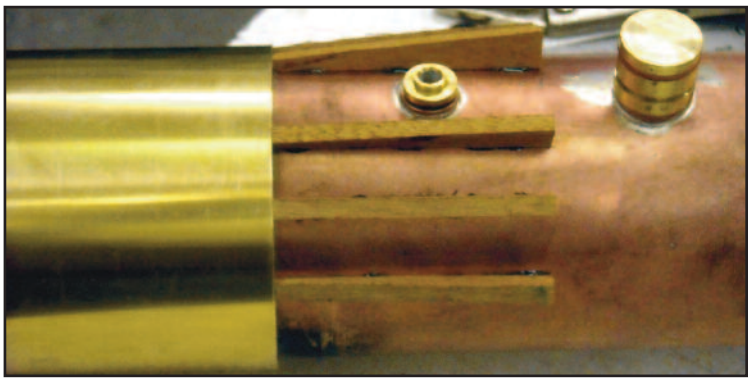

Photo 4-12

BOILER WRAP

The wagon top boiler look of the Triplex was achieved by making a three-piece wrap. The front section is straight and is wrapped over a sheet of one-eighth-inch Fiberfrax, which is a ceramic insulating material. Then tapered strips of oak are cut for the base of the transition piece. The boiler was tapered on the top but not on the bottom, so the strips decrease in taper as they go down the sides — see **Photo 4-12**. Straight strips are then run down the length of the boiler for the rear piece and down the sides of the firebox for the flair there (**Photo 4-13**).

Fiberfrax sheeting is then placed between the oak strips as in **Photos 4-14 & 4-15.**

And finally the brass sheets are soldered together — **Photo 4-16**. The wrap is secured by soldered

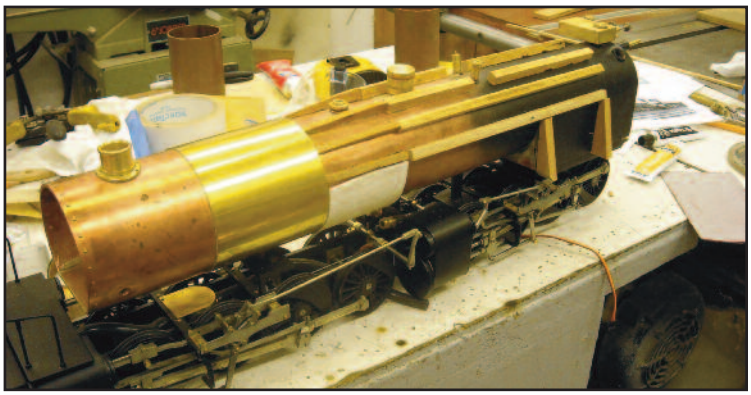

Photo 4-13

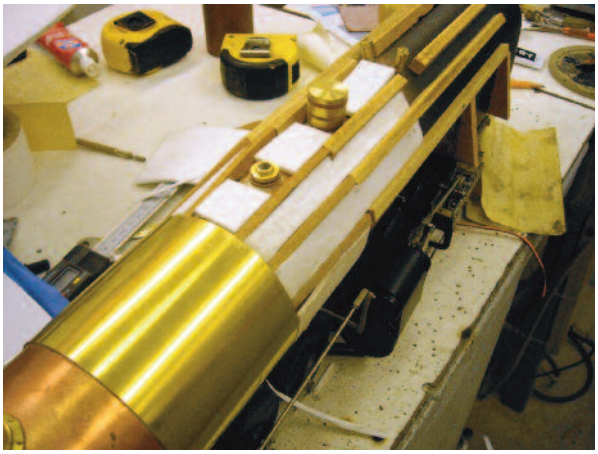

Photo 4-14

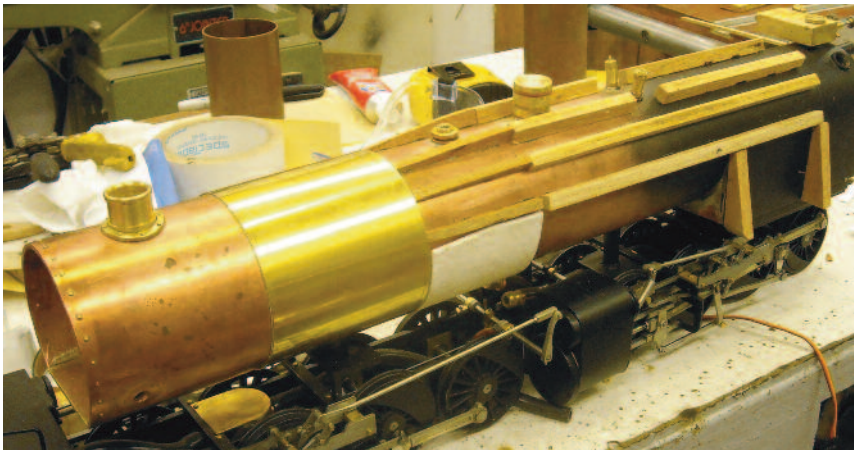

Photo 4-15

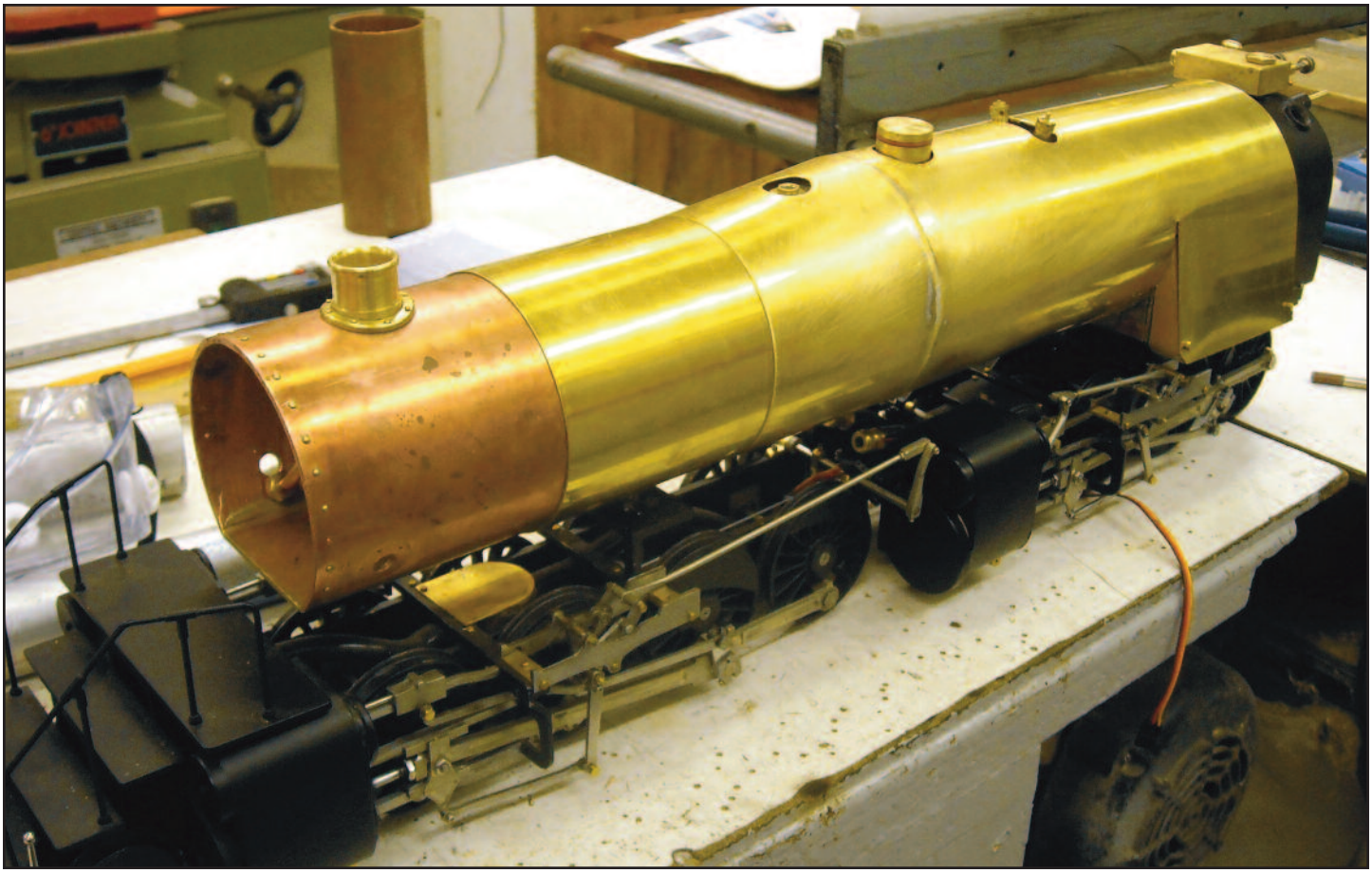

Photo 4-16

Photo 4-17

on brackets at the bottom. I didn't photograph them, but **Photo 4-17** is of another boiler, showing the brackets. One bracket is threaded and the other has a through hole for a long 0-80 screw.

In the next installment we'll mount the domes and other fittings, and this project will start to look like a locomotive!

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Accucraft C-25
Coal Fired Version

Text & Photos by Rob Lenicheck

The prototype D&RGW C-25 was rather an odd duck. It was built in 1903 by the Baldwin Locomotive Works for the Crystal River Railroad in Colorado. Acquired by the then D&RG in 1916 as their #423, it was renumbered to 375 in 1924 by the consolidated D&RGW. What made it odd was that it was the only one of its class on the D&RGW. Bigger than the C-21 class yet smaller than the K-27s, it never seemed to fit well on either branch or main line service. After spending a few years as a switcher in the Durango yards the engine was scrapped in 1949.

Accucraft's model is an accurate rendition of the aesthetics and profile of the prototype. The engine continues Accucraft's fine attention to detail while still fulfilling the "form follows function" design mantra. Perhaps one reason that Accucraft decided to build this 1:20.3 coal-fired version of the C-25 was because it fulfilled the need for a moderately-sized locomotive which could accommodate a fairly large grate area, thus making the coal fire easier to maintain. They have been decidedly successful at this concept with this engine.

The many features of this engine include slide valves ("D" valves) along with a full Stephenson's valve gear, a notched reversing quadrant to take advantage of that (if one wants to), axle pump, tender pump, enlarged water capacity in the tender from the butane version, a prototypical expansion of the frame area at the firebox, water bypass valve and blowdown valve. The firebox coal grate measures 1 ¾-inches by 2 ¼-inches. This is smaller than I would expect given the overall outside dimensions of the firebox but the water legs are more expansive on the boiler. The ashpan and coal grate are a one-piece assembly and smartly attached at only one end so that heat expansion can occur without distorting the grate bars (**Photo 1**).

The engine which was borrowed for this review had enough run time on it to work out any of the expected kinks, although none had been reported. The engine was prepped for running in the usual way: the engine was turned on its side and all the running gear parts between the frames were lubri-

Photo 1 - Closeup view of the coal grate

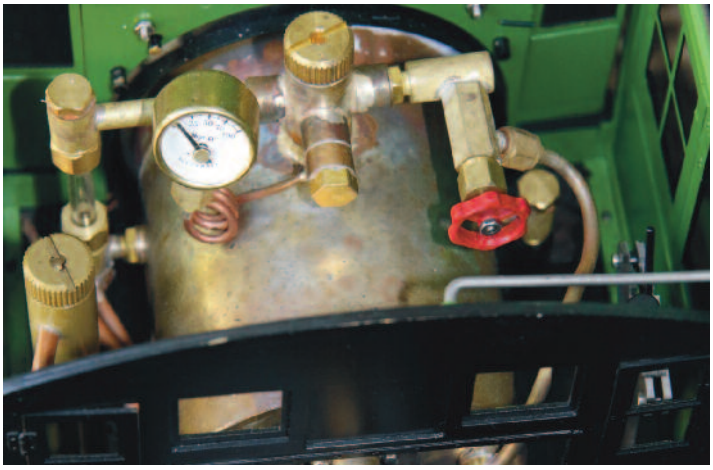


Photo 2- Closeup view of the cab interior.

cated. Care was taken to get all the Stephenson's gear pivots lubricated, along with the axle pump eccentric. It should be noted that the axle pump runs off of the second driver set, not the main axle. Although not the preferred location this did not seem to be detrimental to the performance of the locomotive.

After the lubrication procedure, time was spent with getting familiar with the engine controls. The cab roof pivots off to one side. Perhaps a nit, but it would be preferable to hinge the roof at the front end for quicker and easier access to the controls. The throttle, blower, sight glass and lubricator and boiler check valve are all located in the cab. The water bypass valve is located on the right side of the cab under the running board. As is traditional with Accucraft, the boiler can be filled through a screw-top fitting in the cab (**Photo 2**).

The boiler was filled until the sight glass was three-quarters full. The two hoses to the tender water supply were connected to the engine fittings under the cab. (A nice upgrade which Accucraft should consider on their engines would be to provide quick disconnects for these hoses.) The cab footplate rests on the tender frame even in the backmost position of the drawbar.

Accucraft has enlarged the tender water capacity by opening the back portion of the tender. I added water to the tender in preparation for the run by lifting off the fake coal load. Since the tender and axle pump are plumbed in series, the water lines from the tender pump must be cleared of air bubbles by opening the bypass and pumping water through the line. You may not see water coming out of the bypass return pipe. This is normal: it just means that the water is getting pumped into the boiler as a path of least resistance (**Photo 3**).

Specifications

Scale / Gauge: 1:20.3 / 45 mm
Construction: Brass & Stainless Steel
Mini. Radius: 48 in. (1.2 M)
Length: 33.25 in.
Width: 6.44 in.
Height: 7.52 in.
Features:
Coal Grate
Two cylinders
D-valve
Simulated Stevenson valve gear
Safety valve
Lubricator

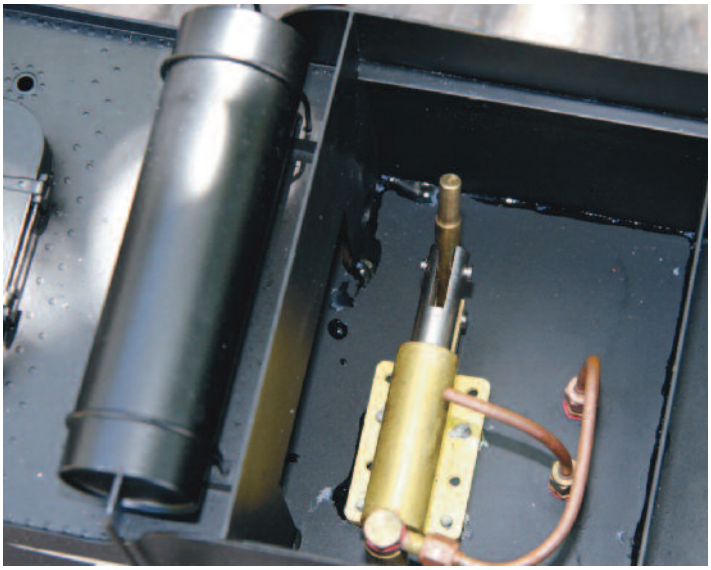


Photo 3 - Tender mounted water pump.

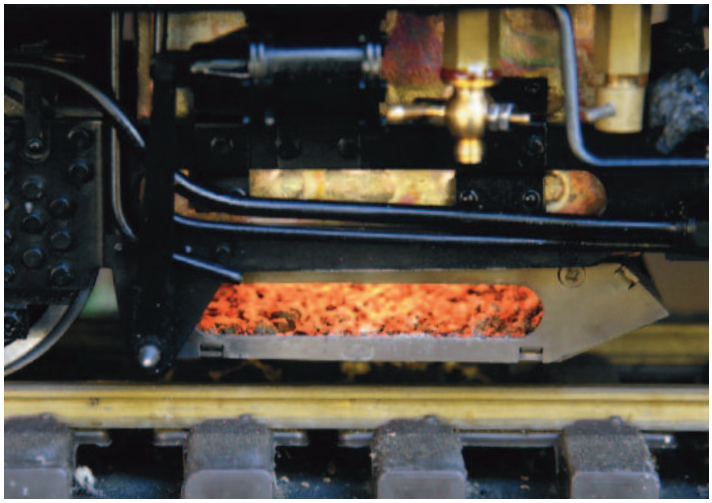


Photo 4 - An impressive glow from the ashpan vents during a coal firing of the locomotive.

Now the fun begins. Start adding the charcoal pieces which have been soaked with kerosene, filling the firebox up to the bottom of the firebox door. Kerosene is the preferred combustion additive because it has minimal smoke and smell. (Lamp oil may work better but friends will be lost, both for the smell and visible smoke.) Accucraft provides the poker and shovel to assist with this task, and the firebox door has a nice hook on it to allow one to grab and control the opening and closing of the door.

Time to grab the draft fan. Once the firebox is full of charcoal, light it off and turn on the fan. (The fan is not provided and must be purchased separately. If the Accucraft fan is used an advantageous improvement is to add a 3rd "D" cell battery to the top, wiring it in series to the existing batteries. The increased voltage won't hurt the fan motor but will give the charcoal a real boost in air draft to help with the combustion.)

The test was performed on a rather warm day, about 75 degrees, and 10 psi pressure was reached in about seven minutes. Lesson learned here: when the blower was opened it was a constant stream of water, indicating that there was too much water in the boiler. The rule of thumb on this engine should be that unless experience teaches otherwise, the water level in the boiler should be reflected in the sight glass being about half full.

Once this water had boiled off and a bit more charcoal added, the blower could be used very successfully. A scoop or two of coal was added and

The supplied "pop" safety worked very nicely when 60psi was reached.

then, as expected, the pressure came up very quickly. The supplied "pop" safety worked very nicely when 60psi was reached. Although the provided cylinder cocks were not used, the engine cleared itself of condensate quickly and off it went. The blower was not needed to maintain a good coal burn, a good sign that the blast pipe was designed correctly. The engine provided a pleasingly audible

Photo 5 - An warm glow from the firebox during the firing of the locomotive.

chuff through the stack. The running gear was smooth and predictable during the entire run of almost an hour. The coal glow was very apparent through the ashpan side vents. (**Photos 4 & 5**). The slope of the fake coal load makes inserting additional coal during the run a breeze.

In an effort to test whether the axle pump could "make up" for a low water level in the boiler, the bypass was opened and water was allowed to return to the tender for a time. The test result confirmed that the axle pump could, indeed, make up the boiler water, albeit at a very slow rate. It is, therefore, prudent to leave the bypass valve closed unless priming is noticed.

The fire was allowed to burn down after a most satisfying run. After a cool down period the pin was easily pulled from the ash pan grate assembly and the ashes dumped. Since the lubricator does not have a valve to control the oil flow, the oil amount left in the lubricator was minimal. If an extended run were to be attempted it is, therefore, recommended that the lubricator be topped up mid-run to assure oil to the cylinders.

Two screws hold the front of the smokebox in place. Those were removed to clean the inside of the smokebox. It should be noted that, because of their close proximity to the pilot support braces, there was not enough room for a 3mm hex drive to cleanly get to the screw heads for removal. Alternatively, Accucraft has supplied smokebox fronts with a working access door. This might be preferable to some although it would make it harder to thoroughly clean the smokebox. Finally, the mechanism was cleaned with a three-to-one solution of mineral spirits to motor oil, finished up by blowing everything off with compressed air.

In conclusion, the locomotive reflects a high degree of satisfaction for both accuracy of design and running characteristics. If you're inclined to jump to a coal-burning, "dark side" type of engine this one can be highly recommended. Bravo to Accucraft!

Editor's Note: You can read about the butane fired version of the C-25 in the May/June 2013 issue of Steam in the Garden, No. 127 reviewed by Carl Weaver. Issue is available on-line in digital format or order as a print back issue.

Clean lines and details makes for a beautiful model.

Building The Kittatinny Mountain Railroad

Text and Photos by Shawn Viggiano

I have always had a fascination with running trains through a garden even as a child. I remember back in my childhood, laying HO track down on the ground and building things out of any toy I had around, from Lego houses to Smurf villages. The track work was very basic, out and back. I would just roll my trains using my hands or set up a scene to look like an abandoned railroad, nothing fancy, just using child fantasies and having fun. I would spend hours creating scenes, digging out ponds and streams and rolling a few train cars back and forth. There was something about a railroad running on the bare earth that intrigued me. Starting with a blank canvas, getting my hands dirty, the smell of the earth, the sounds of being outdoors, using my imagination to create scenes where I could shrink myself down and live in.

It wasn't until I was in my early 30's that my

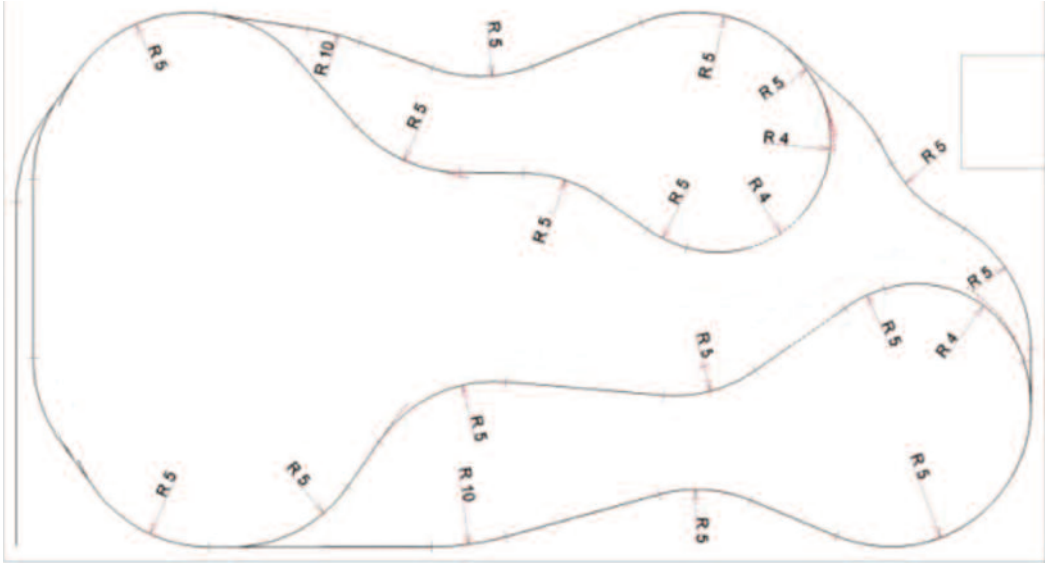
A railroad for all seasons. A Bellflower Cricket braves the cold in winter.

A Bellflower Cricket pauses near the local General Store as a boxcar gets loaded with fresh supplies for the local logging camp.

childhood visions became a reality. Back in 2005 I built my first intricately landscaped garden layout that was fully operational using track power. I had a lot of enjoyment over the years creating thematic scenes and running trains, but despite that, I felt there was something that needed to be added in order to complete my vision. One day I hosted a club meet and one of our members ran a live steam train; it was a modified Ruby with a steam whistle. I still remember seeing it emerge from the tunnel with the steam plume as the whistle went off. I had an epiphany and it was in that moment when I realized what was missing: a real live steam train.

I had always admired steam trains with all the moving parts like the side rods, smoke pouring out of the stack and the old time feel they gave to my layout. I found with the electric trains all I did was turn the power on and set the speed; there was nothing else that really had to be done to interact with the layout. With the live steam there was a process. You had to oil the moving parts, fill the boiler with water, add steam oil and butane then light the fire and wait for the pressure to rise. Once the pressure rose you had to rock the engine back and forth until the cylinders were warm and then off the engine went. I liked the idea that you have to actually drive the train, keeping an eye on the pressure and sight glass, and make adjustments throughout the run; you can't just let go and walk away. I was always a hands-on person and always liked old traditional ways. More of an old soul type. I am the kind of person that would rather fly fish instead of using a spinner rod, use a bow to target practice instead of a shotgun, or use a hand tool over a power tool. Something about the old traditional ways I liked. Steaming incorporated the hands on approach, the challenge, and in some aspects the simplicity.

The same scene a few weeks later as winter turns to spring and the ground covers come back to full color



Track plan of the Kittatinny Mountain Railroad

Most people tend to run live steam trains on elevated track without the garden aspect. It is no doubt easier controlling a live steam train on elevated trackwork. Prepping is done on a siding at a perfect level where you don't have to bend down, no scenery to get in the way as you make adjustments or follow your steam train around the layout. You have less chances of grit collecting in all the moving parts of the train and it's easier to get the trackwork level. It's not too often you see live steam trains running in a garden setting, especially at ground level. Running in a garden does have its challenges. The biggest challenge being at ground level is you have to bend down more while preparing your steamer, but there are other challenges as well. If you have ballast, the grit and plant debris can get into the moving parts, you have to watch for scenery and plants while you follow your engine, and then you have to deal with grades – and of course with a garden line comes the maintenance. It's not for everyone unless you're like me and enjoy the challenges, and figuring out ways to make it easier.

It wasn't until I built my second garden railroad that I was able to build it for live steam running. One of the advantages of running live steam on a layout not built for live steam is learning what *not* to do when building a second layout.

The first thing I did in planning the new layout was the track plan. The track had to be easy to get at from all sides. You never know where your steam locomotive might stop or need some adjustments.

The steaming bay of the Kittatinny Railroad, situated at the lowest point of the backyard to take advantage of maintaining a level layout.

Access to the center of the railway has flat stepping stones that blend in to the topography of the railroad.

Mine scene not only adds interest to the theme of the railroad, but provides a backdrop for scenes on the other side of the mountain.

Making sure I had easy entry was of utmost importance. One way I assured access was keeping the bulk of the track along the outside of the layout. That way I can get to my locomotive without having to step on any scenery or plants. My layout has an outer loop with two reverse loops. The reverse loops go through the center of the layout. To make access easier, I created a dry river bed that allows me to reach the lower sections of the reverse loop. To approach the upper end of the reverse loops I created a path made out of stepping stones.

The second step when designing my layout for live steam was to eliminate grades. This task was a little harder because I was working in an area that had a slope. This proved to be a benefit for me. It allowed me to raise the lower end of the layout enough so that I did not have to get on my knees to prep the locomotives. Having one end elevated gave me an area where I can put a small yard in and work on preparing the locomotives. I also learned

A Regner Henry pauses a moment while moving timber during a harsh snowfall.

A Regner Lumberjack moves the timber during a fall run. Designed with photography and video in mind, the tall trees that line the property provide a great backdrop to the scene.

that getting an area perfectly level was not going to happen, it just adds to the challenge. After all, the real railroads had the same challenges.

The third step was creating a garden layout that had a purpose for my live steam trains. I needed a garden layout that would represent a backwoods logging operation. I didn't want your typical logging line. I wanted mine to be different, it had to have charm. Most of my live steam trains are smaller geared locomotives like the Regner Easy Line locomotives or geared Accucraft. I found they handle grades the best, are easily modified to fit that backwoods look and they have that charm that appealed to me. I scratch-built my building structures and most of the rolling stock, and all my track was hand-laid using red cedar. I felt scratch building everything allowed me to create a layout that would separate it from most other layouts and attain that charm I was after. I like to create buildings found in my local area, like Quarryville Depot and station, the Allamuchy Depot or the Culvers Fire Tower.

The fourth step in creating a layout was to make it appealing for videography and photography. I al-

It's all geared locomotives on the Kittatinney Railroad. Here a Shay gets ready to cross the trestle.

"...it's just magical watching a train steam in the snow".

ways liked to create scenes throughout the layout to show that there is life in the layout 24/7, even when trains are not running. Lights were added to all the buildings, and detailed scenes are placed throughout the layout to give it that sense of life. When running trains I like to place figures made by Little Plastic People through the layout to show activity going on as a train passes by the station. Some of my favorite characters are two guys snowshoeing after a recent snow storm, or hikers having a campfire at the Appalachian Trail shelter. It all helps bring the photos or videos to life, and keeps the layout interesting even when trains are parked for the night.

One of the other challenges with running live steam in a garden is the winter time, especially if you live in a northern climate zone where you get cold and snow five months out of the year. I find it to be a pleasant challenge, though most would disagree with me. I have always enjoyed running steam trains in the winter time. The steam plume effects are more noticeable, using a snow plow to clear the line is a fun event to witness, and it's just magical watching a train steam in the snow.

Running in the winter, especially in the snow, does have its challenges. One of the challenges is keeping the gas tank warm if using butane. Butane does not like cold weather, and having a cold gas tank prevents the butane from turning to gas, causing the flow to be very slow. This results in a weak burner flame. I have found using a propane/butane mix in colder weather to be more effective than just using butane. I also learned that locomotives with the gas tank close to the boiler will run better because the heat from the boiler keeps the gas tank warm. Those locomotives tend to be my go-to engines when running in the winter. Those with the gas tank further away are my warm weather runners. There are ways to keep the gas tank warm. You could use hand warmers or redirect the steam line and wrap it around the gas tank. That way you are using the warm steam to keep the gas tank warm. Another challenge with winter steaming, especially in the snow, is icy tracks. Unlike electric trains where you can keep the engine outside and let the metal wheels acclimate to the outside temperature. With live steam we are dealing with a warm engine and water/steam that sprays all over the track and wheels. I found that prepping the locomotive indoors prevents any spilt water from freezing on contact. Indoors you can wipe the wheels dry before going outdoors. I also found that starting the engine, away from the tracks prevents the initial cold water in the cylinders from getting on the track and freezing.

Running in the snow does have its trial and errors. Some days you can steam for hours with no issue and other days you are lucky to get the locomotive to move a few feet without slipping. Those are the days you just move operations indoors. Again, it's all part of the challenge.

It's nice to be able to look back at the Kittatinny Mountain Railroad today and see that my childhood dreams have come true. The days of pushing a train on poorly laid HO track and buildings made of Legos helped me create the empire I have today. I can sit back and watch a real live steam train trundle through the landscape with steam plumes hitting the cold snowy air.

A cozy campfire and some mountain music at the end of a full day of steaming on the Kittatinney Railroad.

Workshop Project

Make Your Own Copper Rivets

Text & Photos by Marc Horovitz

Riveting is a simple, elegant, and permanent way of joining two pieces of metal. I was working on a project recently that required riveting some parts together. When the project was complete, the rivets would not be visible, or they were to be ground away after soldering. Therefore, I didn't want to use my nice, round head, machine-made rivets. Anything would do as long as it was functional. It occurred to me that I could make my own. Here's how you can do it as I did.

I had on hand some surplus 12-gauge solid-copper wire that I decided to use as rough stock. You could use any size you like, as long as it's solid.

Start by cutting a couple of steel blanks for the rivet form, each about an inch long—anything will do (**Photo 1**). Drill matching holes in the ends of each piece to receive small pieces of 1/16th-inch rod that will act as locators. I used CA cement to secure the rods into the holes on one piece **(Photo 2)**. You could also glue one rod into each piece, ensuring that the pieces could be assembled only one way.

Assemble the pieces, then mark them out for four equally spaced holes. These holes must be drilled precisely on the line that separates the two pieces of the form. Put the assembly in the vise and center punch each of the holes (**Photo 3**). Choose a drill that is one size larger than the diameter of your wire. This will be the diameter of your finished rivets. Drill the four holes to the depth that you want your rivet shanks to be (**Photos 4 and 5**).

Now make a tool like that shown in **Photo 6**. This is nothing more than a piece of scrap with a deep V-shape cut into one end. The exact size and angle don't matter. This will be used to hold the wire in place while it is being cut. You might have to experiment with the thickness, though, as this will determine how much material you have for the rivet's

Photo 1 - Two inch-long steel blanks are first cut.

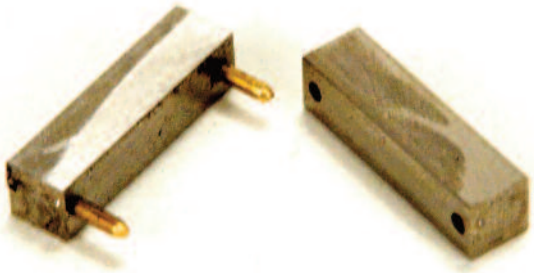


Photo 2 - The ends are drilled for 1/16-inch wires.

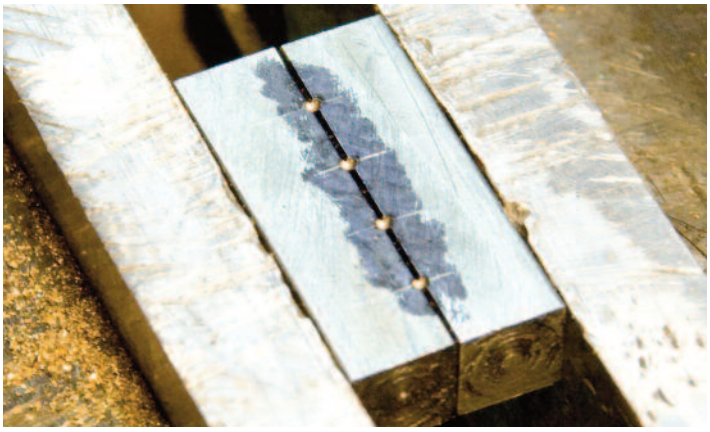


Photo 3 - With the pieces held in the vise, they are marked out and center punched for holes.

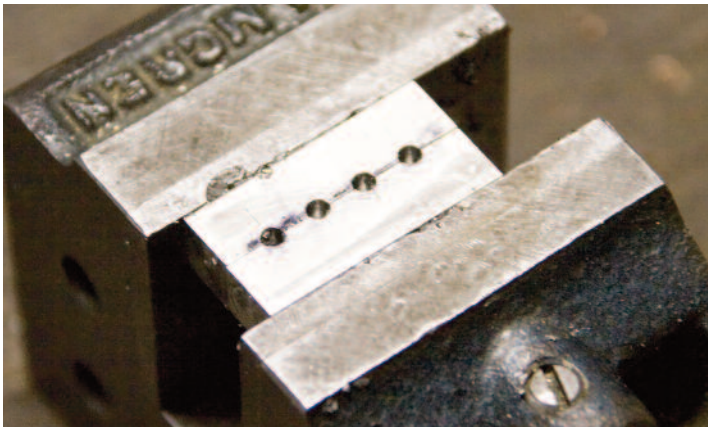


Photo 4 - Holes have been drilled precisely on the dividing line between the two pieces.

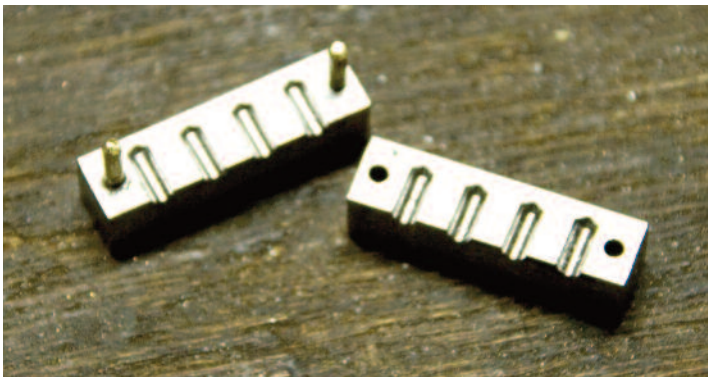


Photo 5 - With the mold open, the holes are apparent.

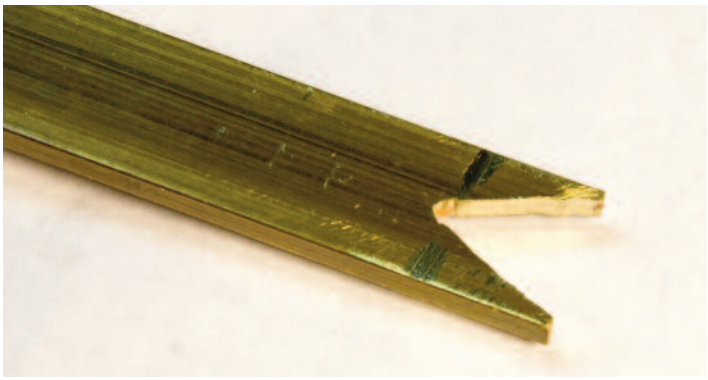


Photo 6 - A V-tool is made from a piece of scrap.

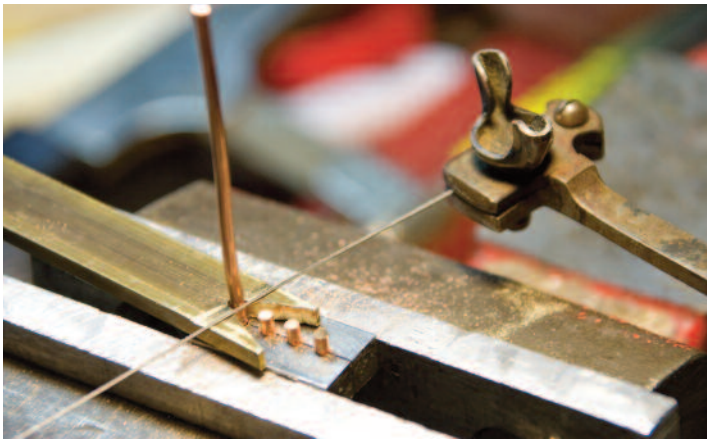


Photo 7 - With the saw blade flat against the V-tool. The blank is cut.

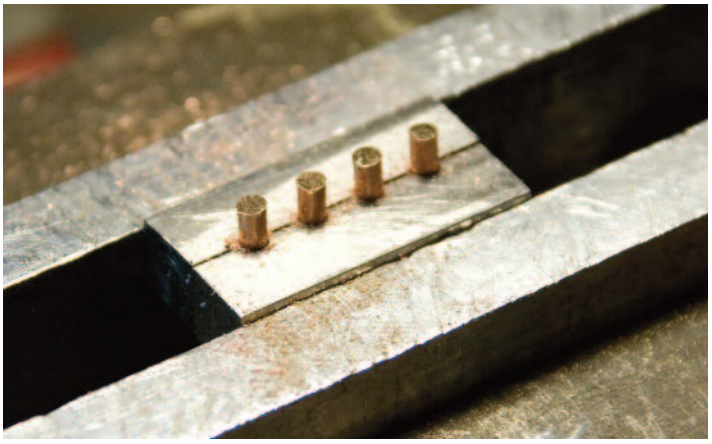


Photo 8 - Four cut blanks, ready to be formed.

head. I found that around one-and-a-half times the diameter seems to work well. Using this tool also helped to guarantee head-thickness uniformity.

Place your wire into the right-hand hole. Then use the V-tool, pressed against the top of the form and into the wire, to secure it while you cut it off. Use a razor saw or a jeweler's saw, with the blade laid flat against the V-tool. When the first blank has been cut, leave it in the hole and put your wire into the next hole, repeating the process. **Photo 7** shows the last wire being cut, with the first three still in place, while **Photo 8** shows all of the blanks ready to be formed into rivets.

Now, with the form gripped tightly in the vise, start tapping the heads of the rivets. Don't give them a mighty whack—that will only lead to tears.

Tap many times lightly with a small hammer. I use a tack hammer. The rivet head will gradually flatten out and form. In **Photo 9** you can see that the two heads on the right have begun to flatten out. **Photo 10** shows the heads fully formed.

As you tap the heads into place, the wire shanks inside will expand to fill the holes. When you take the form apart, the rivets may stick to one half (**Photo 11**). Just pop them out with a screwdriver

Photo 9 - Rivet heads being formed with a tack hammer.

(**Photo 12**). You may find that the heads on some are off-center. This is the result of uneven hammering. With a little practice, you'll get the hang of it,

Photo 10 - Finished rivet heads.

so that you get well-centered heads every time. The lopsided heads are still useable—they just look funny.

To use your rivets, chose a drill bit one size up from the hole diameter in your form. Drill a hole in

Photo 12 - Four finished rivets.

the two pieces that are to be joined. If they are to be joined by several rivets, drill all of the holes in one piece but just a single hole in the other. Deburr them. Then put the pieces together and slip a rivet into the hole. Place the head of the rivet down on a hard, flat surface—the anvil of your vise is good. If the rivet is too long, just snip off the excess.

Tap the exposed shank to form another head, matching the first one on the other side. When this rivet is in place, you can go back and, using the predrilled holes in the first piece as a drilling guide, drill through them into the second piece for perfectly matching holes. Then rivet them likewise. If you find that a rivet won't go through both holes after adjacent holes have been riveted, just redrill the offending hole. Metal tends to shift and flow slightly with the hammering. **Photo 13** shows two pieces of brass that I riveted with my home-made rivets. The rivets work just as well as the fancy ones, even if they don't look quite as nice.

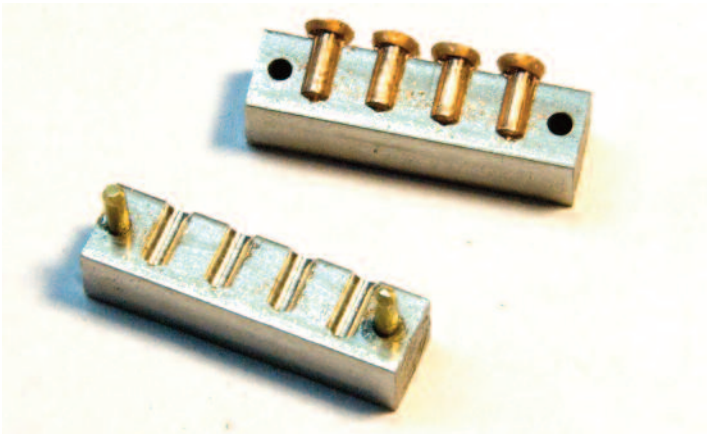


Photo 11 - Rivets clinging to the form, ready to be popped out.

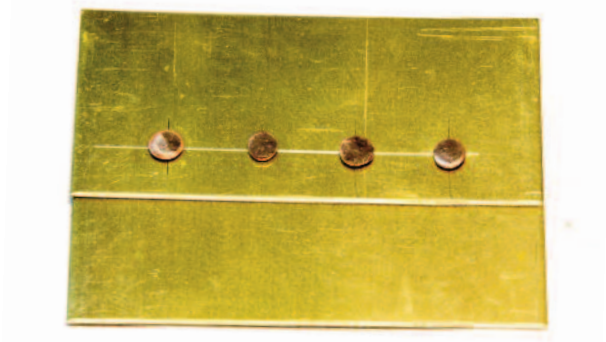


Photo 13 - Finished rivet heads.

Waybill (continued from page 9)

will only be operational from 9:00am to 4:30pm.

The museum has a superb collection of locos, coaches and railway artifacts well worth a visit in its own right. In addition, the Outeniqua Railway Society's HO SAR layout will be open for viewing. While the accent will be on showing off trains running, it is hoped suppliers of model railway equipment will use the opportunity to market their wares, and participants to dispose of their surplus items. For more information contact David Cairns at:

shares@iafrica.com or
northstarrailway@gmail.com

Any additional information will be loaded onto the website *www.northstarrailway.com* under Events.

Mamod Live Steam Models announces New Products - Mamod Live Steam Models of Smethwick, U.K. announce new locomotives being added to their already extensive line of live steam models.

Telford *Mamod U.K. Photo*

The *Telford* locomotive which was recently introduced in O Gauge is now being prepared to enter the Gauge One market. Mamod announced that this move was made with the U.S. market in mind. The *Telford* is a slide valve engine using the proven design of their *Brunel* and *Centurion* models. It incorporates a sliding roof for easy access to the cab workings and has a silver soldered boiler, gas firing, and displacement lubricator.

Mamod is also moving into the battery powered electric arena with their first diesel engine outline locomotive called *Boulton*. The locomotive is adjustable between O and Gauge One. A follow-on radio control version is also being developed with an expected delivery date in September 2018.

Boulton *Mamod U.K. Photo*

Boulton Specifications

- Steel construction
- Dual gauge construction, '1' or '0' gauge
- Length overall (across buffers) 9.6" (245mm)
- Width 3.5" (90mm)
- Height 5.9" (150mm)
- Weight 3lbs. 5oz. (1.5KG)
- Axle centre 3" (77mm)

Features

- Internally framed with external cranks.
- 12v MFA beveled gear motor
- On/Off switch
- Forward and reverse switch
- Variable speed controller
- Trigger for cab release and charge locations at the rear of the cab

For more information visit Mamod at *www.mamod.co.uk*.

Project:

HOW I DID IT

Wheel Bearings

Text by Dan Pantages, Photos by Wendy Pantages

1. Observation

There's nothing better than rolling stock gliding behind your locomotive. I'm talking about changing your rolling stock to ball bearing axle journals on a budget. Here's how I did my Aristocraft heavyweight coaches. I always say your fun time to work time should be 80 percent fun to 20 percent work. This small project works well and can be one hour to as long as you want, depending how many trucks you want to do.

Photos

Photo 1 - Pressing the ball bearings into the newly dimensioned journal.

2. The Fix

First, what tools do you need?

* Screw driver to take the truck apart.
* Electric drill with the right size drill bit. (for these bearings a letter drill "A" size).
* Small flat file, eight to ten- inches long.
* Small pair of channel lock pliers.

If you have a drill press and small lathe that's even better.

Of course you need the ball bearings. I used flanged bearings that measure 02.5mm thick with an inside diameter of 3mm and an outside diameter of 6mm. I found mine by searching on eBay -- $11 for 50 bearings.

Steps

1) Remove the trucks from the cars and take out the four screws holding the side frames to the bolster and remove the wheels.

2) Pull out the brass bushings from the side frames. (keep them for another project, I haven't come up

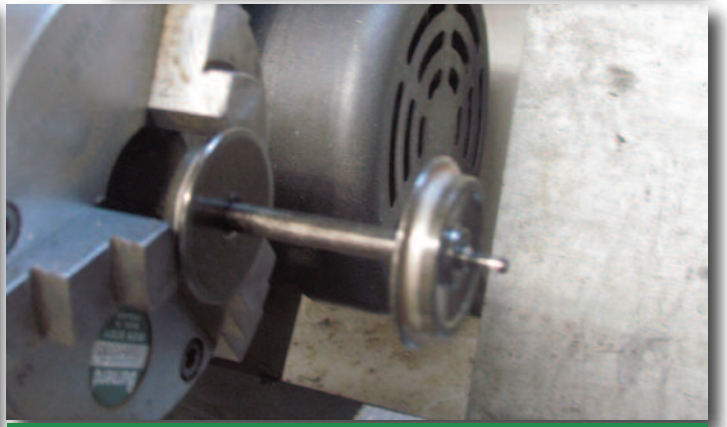
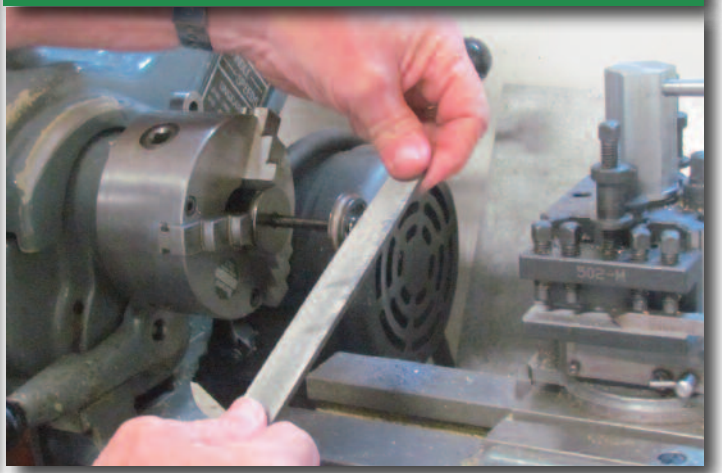


Photo 2 & 3 - Wheel axle in the lathe to file down to the ball bearing diameter.



with one yet, maybe one of you will).

3) Using letter drill "A" drill out the hole left from removing the brass bushings. Let the drill centre itself and hold the axle box down, go easy so the drill bit does not grab. Remember you only have to drill 02.5mm deep. If you do a little more that's OK, these bearings have a flange on them to seat them squarely in the hole. I used a small pair of channel lock pliers to squeeze the bearings into place **(Photo 1)** .

4) **(Photo 2-3)** Now put a wheel/axle set in your drill or lathe. With it turning around 100RPM, use the flat file and give the exposed axle end about 6 to 8 strokes, then with the drill or lathe stopped try and see if the bearing fits. If not, give it a couple more strokes and try again. If it fits, do the rest of the ends.

5) Now reassemble the trucks and replace them on the car.

Try the car on your track, you will be impressed. I have always said my track is dead level, OK not so much. I put the first car I did on the track only to have it roll away about 20ft before it stopped.

Do you have a simple tip or quick afternoon project that you want to share. Send it in to us via e-mail at sitg@steamup.com. Make sure to mention it's for "How I Did It" - editor

TIMETABLE

Special Meets

Los Angeles Live Steamers - Fall 2018 Meet. 14-16 September 2018. 5202 Zoo Drive (Griffith Park), Los Angeles, California, 90027. Watch *www.lals.org* for more schedule information.

Regular steamups

Southern California Steamers. Contact Jim Gabelich for dates, places and other pertinent information. (310) 373-3096. jfgabelich@msn.com.

Crescent City High Iron. Steamups as necessary on an elevated backyard layout on Northern California's upper coast. Info: Don Cure, diamondd1947@msn.com.

On the Brink Live Steamers. Wednesday, and occasional weekend, greater Sacramento, Calif., steamups on elevated live-steam tracks at two locations, as well as special events. Info: Paul Brink, (916) 935-1559, paulbr@aol.com.

Puget Sound Garden Railway Society. Two steamups per month, one at the Johnsons' on the second Saturday and a steamup at a member's track on the fourth Saturday.
Info: *http://psgrs.org/* or call Pete Comley at (253) 862-6748.

Greater Baton Rouge Model Railroad Club Open House and Gauge One Steamup. Info: Ted Powell, (225) 236-2718 (cell), (225) 654-3615 (home), powell876@hotmail.com.

CONTRIBUTOR BIOS

The magazine couldn't exist if it were not for the dedicated individuals who take time from the hobby to chronicle their endeavors, interests, and joy of live steam. If you get a chance to meet any of our contributors at a steamup, please thank them for their contribution.

Bill Allen - Bill lives in Woodside, California and first became interested in live steam in 2008 when he saw Richard Murray's layout at a BAGRS open house. He proceeded to buy a Ruby, C16 and Forney before deciding to start building his own. He bought a mill and lathe and with the help of some BAGRS members learned to use them, and was soon making chips. Since then he has completed 20 projects, some of which have been featured in *Steam in the Garden*, and currently has a multi-part article running in *Live Steam*. All of his builds are one-of-a-kind, as he only builds those which have never been done before and probably will never be done again in G gauge live steam. Bill's prior hobby was building fine furniture and he uses some of those skills and tools in his engine building.

Marc Horovitz - Marc has been interested in steam locomotives — both large and small — all of his life. In 1979 he opened the Light Railway Division of his existing business, Sidestreet Bannerworks, for the purpose of importing small scale live steamers in the U.S. Sidestreet Bannerworks was the original US importer of the Beck Anna and other Beck locos. Marc began writing the "Small Scale Live Steam" column for LIVE STEAM magazine around 1980, and continued on for five years or so, until Garden Railways magazine began to evolve. He has kit-bashed and built many steam locomotives.

Rob Kuhlman - Rob is a retired geologist who lives in southeastern Pennsylvania. He began modeling trains with HO during the adolescent years, moved up to quarter-inch scale during the '80s and '90s, and then discovered live steam with the earliest issues of SitG. The years spent in 0 scale pointed him to SM32 and the use of many 0 scale raw materials in those early days when commercial products were scarce. Though SM32 remains his primary interest, he also steams early 0 gauge tinplate and has recently been flirting with British mainline live steam in Gauge One. For the last 20-plus years he has produced the electronic bimonthly 32mm/0 Gauge Newsletter.

Rob Lenicheck - Being a Colorado native, Rob Lenicheck was born with narrow gauge steam in his blood. He started modeling in HO in junior high, thanks to a suggestion from a "friend", moving on to HOn3 in high school, and finally to On3 in his early twenties. Unknown to Rob at the time, the Gauge One live steam hook was set deeply about 20 years ago when that same "friend" revealed his collection. Rob now spends much of his time scratch building engines. He has degrees in Music Education and Mechanical Engineering.

Sean Viggiano - Shawn Viggiano is from Wantage, NJ and has been into model trains all his life. His early collections entailed Lionel and N scale trains and by 2006, the dream of having a garden railway became reality. In 2010 his first live steam train, an Aristocraft 0-4-0, had its first run on the rails and he has been hooked ever since. "I like running mainly smaller geared steam trains like Regner Easy Line and Accucraft geared locomotives. They have a charm to them that works with a backwoods logging line. I enjoy sharing my garden train hobby with my wife and three kids." Shawn currently works as a Park Police Officer for the NJ State Park Service.

THE CUPOLA VIEW

"Is the thrill that'll gitcha when you get your picture, On the cover of the ..." Dr. Hook

Dr. Hook knew about the thrill of being on the cover of a prestigious magazine. Do you aspire to the same thrill? Here at *Steam in the Garden* we are constantly on the lookout for photos that can hold up to the rigors of making the grade as a cover shot. Something to think about as you plan your photo shoots for that article you're submitting.

Publication Photo Submission Guidelines – The following is a snippet from our submission guidelines that can be found at *www.steamup.com* under the "Contributing" menu item at the bottom of the page

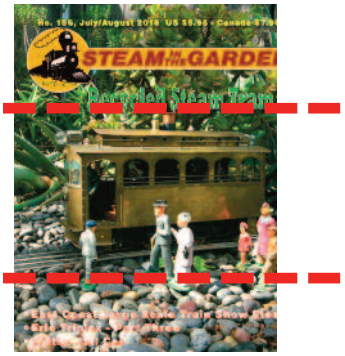
"Photography guidelines:

While some photos reproduced in the magazine may be black-and-white and all the photos on the web site are normal web resolution, we request that all photography submitted to the magazine be RGB (or sRGB) in high resolution.

This means that JPEG files must be between 1.5- and 3-megabytes each (sized at least 300 dots-per-inch and 8¾-inches wide).

The rationale behind this requirement is that we want photos that can be used in the full width of the print magazine's page, which is four-color reproduction. Our printer's presses require 300-dots-per-inch for that to happen and a full page is 11 inches tall, meaning we need at least 3300 dots vertically to be able to use a photo to fill a page. (Said another way: shoot with at least a 9-megapixel camera and don't change resolution.)"

Pretty simple guidelines. But there is also something else to think about – how a photo will appear on the cover. Our cover is a portrait (vertical) presentation that is divided into thirds.



The top third is for our banner. When planning a cover shot, this area should not have too much of the main subject in view. A background of plants, rocks, and sky all help to ensure that our banner doesn't detract from your project that is the main focus of the article.

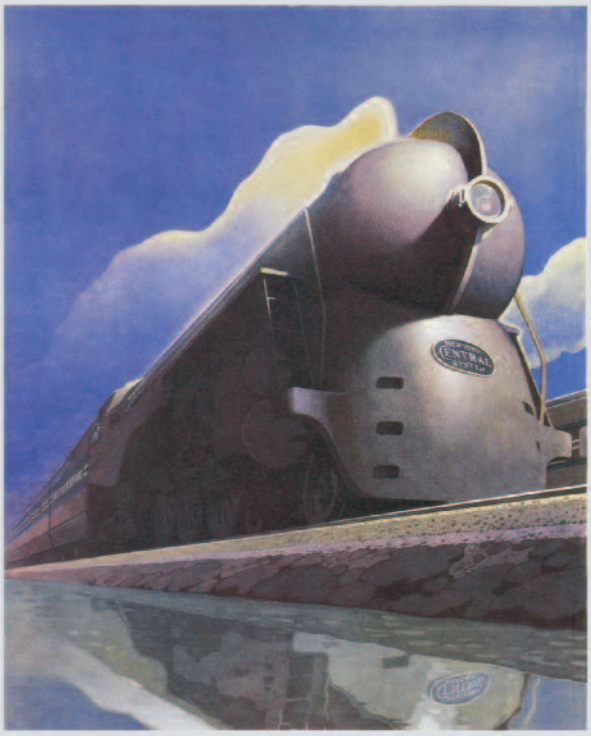
The middle third is where your project is showcased. This area may also include some text to announce your article. We endeavor to reduce covering the subject with text as much as possible. Leaving room around the subject helps. If you look back through previous covers, available online by browsing the back issues section of our website, you will notice a preponderance of shots where the subject is a head-on, three-quarter view, from medium high to low angle. The best thing to do is to take several shots at various angles and elevations keeping in mind what fills the top and bottom third. Always allow room along the sides, we'll do the cropping if needed.

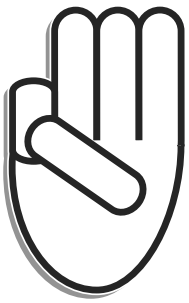
Bottom third is where we list the names of other articles. If you keep in mind the same rule of thumb for the top third here as well, then you'll get that picture that helps us to decide which one we'll use.

So are you ready to get the "thrill that'll gitcha when you get your picture, on the cover of *Steam in the Garden*" (my apologies to Dr. Hook, couldn't pass it up), then be sure to follow our "rule of thirds". You never know what we'll select, but by including several possible cover shots with your other picture submissions for your article, the chance of getting a cover increases. Oh, and don't forget, if your camera can print a date on the image, please turn it off for all shots! Thanks, and we'll see your picture on our cover soon!

Cheers, and Happy Steaming — *Scott*

'Cupola view' is written by Editor Scott E. McDonald: you can contact him at sitgeditor@gmail.com or P.O. Box 1539, Lorton, VA 22199.





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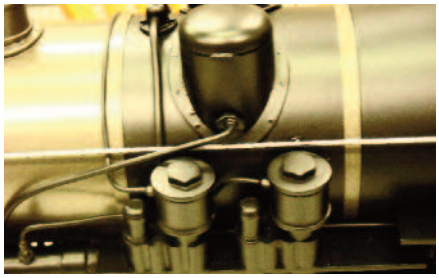

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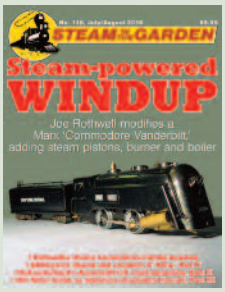
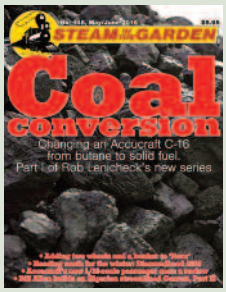
Vol. 26, No. 5; Issue 147/148; September/December 2016, Aster & Accucraft, 'Casey Jones' cars, Tasmania, Maine engines, Steam at the 32nd National Garden Railway Convention,Coal conversion: Part III and IV of six, National Summer Steamup, 'Dora' wheelie. Part III of 3,Project 23: scratch building the SR&RL 2-6-2, Stationaries: at National Summer Steamup

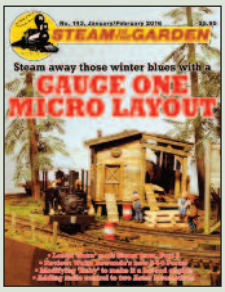


Vol. 26, No. 4; Issue 146; July/August 2016 Steam-powered windup: building a 'Commodore Vanderbilt' 32mm-gauge steamer • Portlandia: a photo essay from Staver Locomotive • Adding two wheels and a bunker to 'Dora," Part II • Accucraft C-16 coal conversion, Part II • Algerian streamlined Garratt, Part III •Latest waybill: Wuhu, Roundhouse.



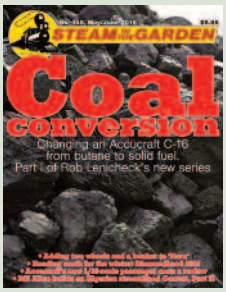
Vol. 26, No. 3; Issue 145; May/June 2016 Coal conversion: Changing an Accucraft C-16 from butane to solid fuel • 'Dora' wheelie • Streamlined Garrett: 1:32-scale scratch built steamer. Part II of three • Pleasing Pullmans • Locomotive diversity: International Small Scale Steamup in Diamondhead. • Latest waybill: Aster, Accucraft, Regner.

Vol. 26, No. 2; Issue 144; March/April 2016 FEF-3: Locomotive review and workshop project building Aster kit • Resurrection of Bowman steamer • 'Dordlebug': A rail bus out of a 'Dora' and a plastic rail car • Streamlined Garrett: 1:32-scale scratch built steamer. Part I of three • Steam in the scenery • Latest waybill: Flair, Bates obituaries, bearing kits.

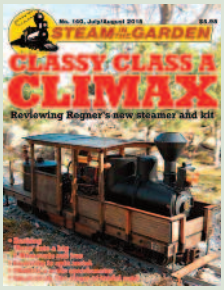


Vol. 26, No. 1; Issue 143; Jan./Feb. 2016 Micro layout: Building an indoor Gauge One track • Review of Wuhu Bowande Porter • Hot-rod 'Ruby': Hopping up a 1:20.3-scale engine • Rolex Asters: Adding radio control • Learning to model in tinplate with a 'Dora' modification, Part III • Latest waybill: Llagas Creek Railways sold, U.K. distributors merge.

Vol. 25, No. 5; Issue 141; Sept./Oct. 2015 Mamod's latest: 'Brunel' • Learning to model in tinplate with a 'Dora' modification, Part I • Live-steam group makes sixth appearance at Maker Faire • Adding mesh to Accucraft burner • Salute to Tom King • New products: Aster 0-4-0, Wuhu Bowande German 2-6-2T, Train Dept. with two 7/8ths-scale.



Vol. 25, No. 6; Issue 142; Nov./Dec. 2015 Sacramento stationaries: 2015 National Summer Steamup highlights • Review of Wuhu Bowande G5 • Building an Accucraft 'Ruby' kit • Learning to model in tinplate with a 'Dora' modification, Part II • 7/8ths WWI car • Latest waybill: 1:32-scale U.K. 'Victory,' 1:20.3-scale 8-driver Saxon.



Vol. 25, No. 4; Issue 140; July/August 2015 Classy Class A Climax — Regner steamer and kit review • Big 'Dora' — Making it a 1:13.7-scale rail bus • Spinning metal • Cabin Fever • Speedometer • Latest waybill: Garratt from Roundhouse; in memoriam — Peter Jobusch; Accucraft UK goes with an African steamer; Mamod saddle-tank loco.

Vol. 25, No. 3; Issue 139; May/June 2015 Steaming amongst the magnolias: Diamondhead 2015 • Laser Loco: Aspinall 0-6-0 (series Part Two) • Workshop: sample tools and equipment • Wicks: A new material • Open cab 'Dora' • Latest waybill: Swiss, U.S. locomotives on the way; a new version of Saxonian in 1:20.3 scale.

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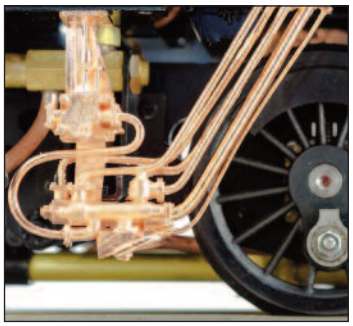

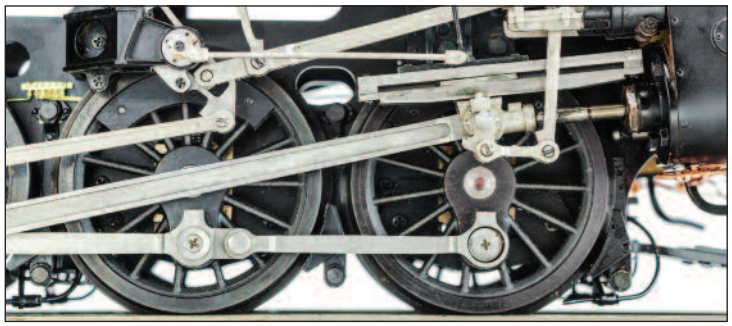

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