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STEAM IN THE GARDEN

Finishing the Freelance Heisler

Freelance Heisler Project - Part 6, National Summer Steamup 2019, Detailed Back Heads... and lots more!

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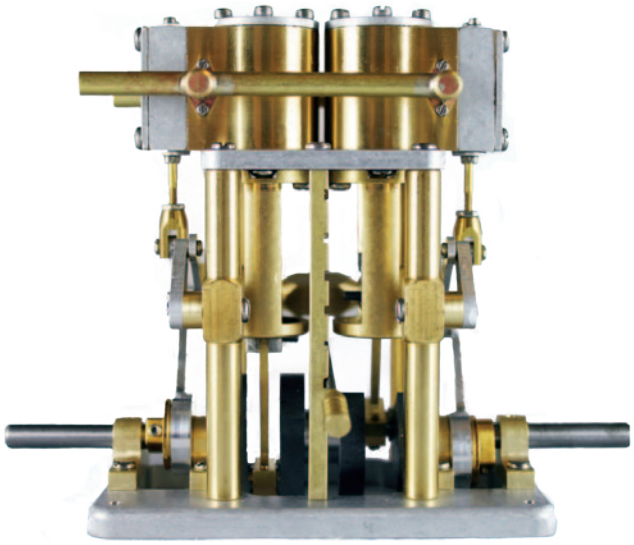

TVR1A

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"
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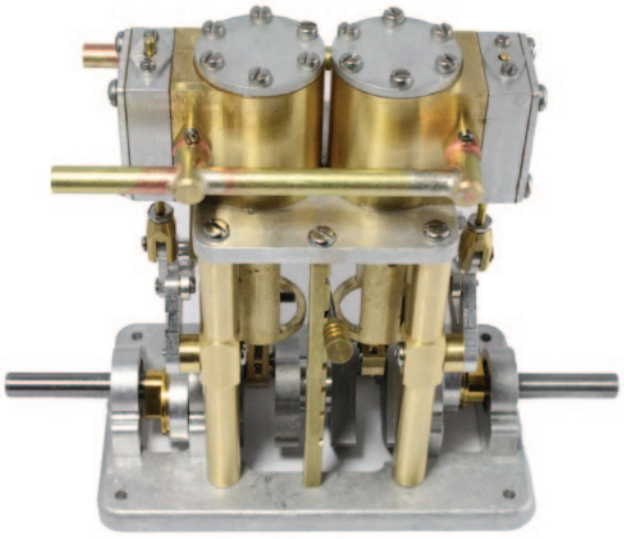

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Ready to assemble steam engine kit: $295
Fully assembled and tested: $400
Includes all hardware
SAME AS TVR1A but with shielded ball bearings
Includes full-color assembly manual
Dimensions: Same as TVR1A
Weight: 323 g

Flywheels for TVR1A / TVR1ABB

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1 3/8" DIA
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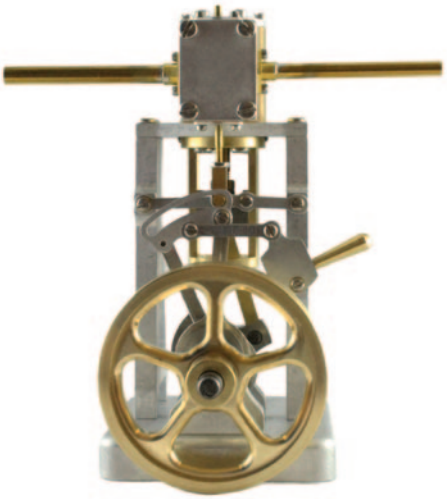
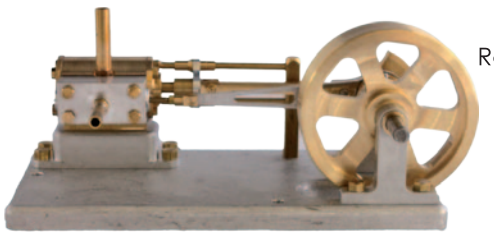
1 3/4" DIA (5 Spoke)

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





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Ready to assemble steam engine kit: $95
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Kit includes all hardware
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Double acting, single cylinder
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Vol. 29 No. 5; Issue No. 165; January/February 2020

STEAM IN THE GARDEN

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

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POSTMASTER: Send Form 3579 to Steam in the Garden, P.O. Box 335, Newark Valley, N.Y. 13811-0335.

Subscriptions for the United States, Canada or overseas should be mailed to Steam in the Garden, P.O. Box 335, Newark Valley, N.Y. 13811-0335. Phone, fax and e-mail subscriptions are gladly accepted and we take VISA, Discover and MasterCard. PayPal payments are also available. Phone: (607) 642-8119; fax: (253) 323-2125.

Hobby retailers: Contact Kalmbach Publishing Co. at (800) 588-1544, ext. 818, if you wish to stock Steam in the Garden in your store.

Steam in the Garden LLC
A Utah corporation

Dan Pantages, **President** — Howard Freed, **Secretary/Treasurer**

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Editorial: P.O. Box 1539, Lorton, VA 22199 USA

Advertising: 10321 Northvale Road Los Angeles, Calif. 90064-4330 USA

Circulation: P.O. Box 335 Newark Valley, N.Y. 13811-0335.

Steam in the Garden (USPS 011-885, ISSN 1078-859X) is published bimonthly for $35 (Canada: $US42; Overseas: $US72) per year (six issues) by Steam in the Garden LLC, P.O. Box 335, Newark Valley, N.Y. 13811-0335. New subscriptions, please allow six-eight weeks for delivery. Periodical postage paid at Newark Valley, N.Y., and additional mailing offices.

http://www.steamup.com/

Cover: Les Knoll's newly completed Heisler sparkles in the woods of his garden railway. **Photo by Les Knoll**

Also inside:

LATEST WAYBILL

The Train Department, Hazlet, NJ Announces New Regner Heisler

Jason Kovacs revealed the newest addition to the Regner line of geared locomotives with a model based on a 10 Ton Heisler. The inspiration for this model is the F.A. Addington, first Heisler built by Dunkirk Engineering Company in 1891. This is a custom-build kit designed for The Train Department by Regner. Delivery is planned for end of year 2019.

Heisler Specifications

Length over Buffer: 12.5 in. (318mm)
Width: 3.78 in. (96 mm)
Height with Stack: 16.37 in. (62mm)
Engine:
- V-steam engine 86°
- Teflon piston 10 mm Dia
- Stroke 14 mm
- New reversing valve with Teflon control piston

Boiler:
- Steam boiler with poker tube burner
- OD 52 mm
- Operating pressure: 3 bar
- Pressure gauge: 0-6 bar

Fittings: Sight glass and goodall valve
Minimum Radius: LGB R1(4.2 feet)
Weight 2.3 kg

MSRP: $2050.00 (Kit)

Accessories / Extras:
- Cow catcher (PN 25426) $81.00
- Lamp (PN 25403) $51.00
- Diamond Smokestack (PN 25427) $52.00

Accucraft & Aster Announce new models for 2020 - In a joint statement, Accucraft and Aster announced their plans for the production of three new British live steam models. The LNER Class B1

LNER Thompson Class B1 *Accucraft Photo*

(Mayflower), the LNER Class P2 (Cock o' the North), and the Adams Radial Tank 4-4-2T. Release of the B1 is scheduled for Christmas 2019 and the P2 for later 2020. These projects will be thoroughly tested and sample kits will be independently verified by trusted builders. Our British customers can count on Accucraft UK, the sole UK distributor of Aster and Accucraft, for all their sales and service needs.

"Global distribution for Aster will continue to be based out of California and a list of our trusted network of distributors and dealers can be found on our webpage under dealers.

"Accucraft Trains will continue its mission of providing high quality affordable steam and electric models and rolling stock in various scales. Since our collaboration began, we've had the added benefit of improving Accucraft's manufacturing process with higher quality Japanese parts. Ultimately, Aster Hobby will continue to supply the Gauge 1 hobby with top of the line collectable live steam models for many years to come."

Adams Radial Tank 4-4-2T *Accucraft Photo*

National Summer Steamup 2019

Text by Jeff Campbell
Photos By Rick Parker, Carla Brand Breitner

After a long, let's call it mind numbing, six-hour drive from Southern California, I was getting close. The exit at Watt Ave, then the left turn on Palm Ave..... and there it was. Colorful and gleaming in the Sacramento sun the McClellan Conference Center was standing right in front of me. The reason for all hobbying activities and most mental energy for the past four months (six if you ask my wife) was finally glowing there like a monument to the celebration of steam. I was quivering with excitement. Four days of steam trains and good friends was finally going to happen.

It is difficult to describe the time leading up to the Steamup. The excitement of the weekend mixed with the stress (or is this just me) of getting everything ready is all-consuming. Despite the huge emphasis put on preparing the trains and locos which now took up all available space in my pickup, the best part of any steamup is always the people. Therefore, it was great to walk into the convention hall at 3:00 on Wednesday, July 10th, and immediately see familiar faces. I had missed the last two Summer Steamups, so where faces were familiar, names were shaky, if not completely absent. Fortunately, there's nothing that will make you feel more welcome than volunteering to help

McClellan Conference Center gleems like a beacon for all live steamers ready to enjoy the Steamup.

Michael Williams of Eureka, CA tends to his Accucraft K-36

Photos by Rick Parker unless otherwise noted.

Carla Brand Breitner and Gary Woolard show their team work in getting an Accucraft Shay ready to run.

Shays are popular in California.

Greg Dahlem of Santa Monica, CA readies his Aster Sterling Single as Peter Comley of Lake Tapps, WA looks on.

Jim McDavid (left) observes the firing of Bill Baxley's Aster Alishan Shay.

someone put together their modular railroad. It works like a charm and I recommend it for anyone who is attending for the first time. Once you share a pinched finger with fellow assemblers, you have those friends for life. As the tracks go up it is very satisfying to see the hall turn into the exciting place we all know it to be. With the assembly done I connected with a number of other Southern California steamers and we commenced with the obligatory jibber-jabber about hotels, food, and who brought what to run. It was nice to see the excitement in them as well.

Thursday started early. I though 7:00 AM might be too early but I found Bill Wilbanks and Jim McDavid well into their first long runs of the day on the big "Paso Robles" track. It appears that the convention hall doors open automatically at 5:30, and they felt like someone should be there to keep an eye on the place. I later found out that Craig Griffin (one of the Steam Events 'blue shirts') often stays in the hall until 1:00 AM for the same reason. What some people won't sacrifice for steam.

Thursday is a great day at the Steamup due to track availability and the constant trickle of new faces coming in all day. You can feel the momentum building as friends with more and more intriguing consists start to get track time. And yes, there is an ever-growing pile of cool stuff accumulating on the swap table. On that note, there is an interesting phenomenon going on around the swap table, worthy of scientific study. Have you ever noticed the undeniable increase of gravitational pull around the swap table? Some hapless steamers can't escape it. They keep orbiting it over and over again like a far flung asteroid, a glazed but hopeful look in their eyes. I have been caught in it myself. The pull seems to decrease somewhat once a new locomotive or piece of rolling stock has been purchased, but it never seems to completely go away. Hmmm.

In any event, there is steaming to be done! The quality, complexity, and creativity of steamer's equipment continued to grow through the weekend. It was almost too much to handle. Jim Hadden brought his scratch-built steam powered snow plow that was being pushed by two coal-fired Denver Rio Grande K's under the control of Rob Lenicheck and Joel Taylor. The detail and level of function from this live steam plow is magnificent. This seemed to start a rash of lash-ups that took

Jim Hadden of Midway, UT prepares his scratchbuilt D&RGW snow plow as Joel Taylor of San Jose, CA preps his K Class locomotive to provide a helping push for the plow.

CBB Photo

Alan Redeker of Queensbury, NY makes a few final adjustments of his newly completed Accucraft Cab Forward conversion to a Yellowstone.

CBB Photo

Lots of great deals were to be had at the swap table. Many new and gently used locomotives as well as rolling stock exchanged hands over the course of the event.

Accucraft C-19 Triple Header makes the curve on the large Paso Robles Track.

Gary Woolard Photo

Sonny Wizelman of Los Angeles, CA fuels his Accucraft Cab Forward for the first time in a few years. He's ready and determined to put on a good show!

CBB Photo

Peter Ronney of Monrovia, CA prepares this miniature steam tractor for a trip in between the mainlines. His fuel of choice? Aloe Vera hand cream.

CBB Photo

over the Paso track. Duc Nguyen ran his beautiful Aster Challenger and FEF in tandem on a single remote control. He said that it took him two years to get them to both run on a single radio throttle, but the result with a long passenger train was impressive. Bill Bivings, Richard Van Slyke and I ran a triple head of Accucraft C-19s with a consist of dilapidated DRGW cars. The sights and sounds were great and much was learned about the difficulty of running lash ups.

On Friday and Saturday there were informative seminars on different aspects of small scale live steam that included topics from chain & gear drives to CAD. Equally interesting was the Dealer room, where one could find everything to get into or maintain the hobby. Mark Johnson at Silver State Trains had a vast assortment of cars and parts and Pete Comley from Sunset Valley Railroad had samples of his track and switches that demonstrate a great deal of detail and precision. Jason Kovac of The Train Department had parts and samples of his newest products, and Alan Redeker had a number of his exquisite cab forward and 2-8-8-4 Yellowstone conversions that bogle the mind. He told me that on the Yellowstone there are 40 new castings forward of the front cylinders alone. And of course David Frediani was there selling his 7/8th cars and whimsical figures in what he describes as his constant attempt to get his grandkids through college. There appeared to be a little more gravity pulling people into this room as well. A black hole with steam coming out of it comes to mind. Hmmmm.

All through the weekend there were amazing things for the avid steamer to enjoy. Friday morning, I noticed Joe Rothwell and Peter Ronney staring at a diminutive steam tractor that was trying desperately to drag itself across a table. It was attractive and mechanically interesting but the real kicker was what they were heating the water with. They told me that they were using Aloe Vera hand cream for fuel. "Wait, what?" Apparently, the hand cream is 70 percent alcohol and burns quite well. Put that on the list of things I didn't expect to hear at a steam-up. Nonetheless, here is a steam tractor the size of a stapler putting along under its own power, and, smelling so fresh.

I sat down with Gary Francke from New Hampshire who started pulling out some beautiful scratch built locomotives that he, "tossed together."

Real Antique live steam(left) and modern interpretations of vintage style locomotives graced the tracks.

Each was a small work of art. They were all in the 0-4-0 geared configuration and he said they often perform well, but can be cantankerous. (Yeah, I know people like that.) The craftsmanship is great and his ability to think outside the box is unmatched. Like most style English locomotives, they each had name plate on the side. Gary said that he found a company that manufactures dog tags, and, with a little trial and error he found the perfect typeface to use. He just grinds off the key ring loop before mounting. Very creative. Another eye catcher was the blacksmith car on Jim Goss' logging train.

Friday night appeared to be lightly attended. Perhaps the adrenalin wall had been hit and people just needed a break. Saturday however, was hoppin'. The track reservation board was full all day and into the evening with impressive trains. Each time Jim Goss steamed up his Blue Comet with a Bill Allen custom-built engine, there were more passenger cars in the consist. I think there ended up being ten, all in a brilliant blue with fantastic interiors and lighting. It was also a joy to see the look on Sonny Wizelman's face when his Accucraft Cab Forward ran for the first time in years on the Triple R - Llagas track. He sat there like a proud parent at his kid's first piano recital. Another gem was Greg Dahlem's Aster Sterling Single and its consist of teak coaches, built by Pete Comley. This little engine was so small that it might be missed by the casual observer, but under closer inspection the detail and mechanical precision was a joy to see. With its coaches it looked like a well-crafted piece of handmade jewelry running under steam power.

There was a time when it looked like every track in the hall was being used, but there were so many

Bob Sorenson of Las Vegas, NV gets up close to his scratchbuilt "Nina". A single vertical cylinder geared locomotive designed by Ernest Glaser and akin to the "Cricket".

Gary Franke of Giford, NH unboxes one of his scratchbuilt 0-4-0's which he brought out for the steamup.

CBB Photo

Jim Goss of San Jose, CA runs his newly acquired "Blue Comet". Watch for more about this custom build in future issues of SitG.

CBB Photo

There were a lot of lash-ups of locomotives throughout the steamup. Here Tom Burns of Sugar Land, TX (right) runs his Accucraft C-16 double-headed with his Mason Bogie under the watchful eye of Richard Murray of Millbrae CA

CBB Photo

of them that I never felt like I was not getting enough runs or that I was being pinched for time. In fact, I came to enjoy the transfer process that takes place when one steamer comes off the track and another goes on. A kind of teamwork kicks in as siding and main line options are discussed and the timing of such things is decided on. All with the upmost of cheerfulness and a great deal of humor.

Saturday night approached and with it the stationary engines came to life. What a collection of contraptions, gizmos, and mechanical spectacles. Steam engines of every shape and function with every possible type of valve gear driving Ferris wheels, generators, dynamos, nonsense machines, as well as a full machine shop. One comment I overheard was, and I quote, "That is the weirdest dang thing I have ever seen."

The stationary table draws quite a crowd but

A colorful Ferris Wheel driven by a stationary steam plant delights a guest during the "Stationary Saturday" steamup.

"Stationary Saturday" brings all of the stationary live steam into action on the last day of the Steamup. Here a gaggle of attendees view and discuss this year's offerings for this part of the annual event.

soon it was time to collect at the back of the hall for announcements and door prizes, with your host, Chris Coley. We started with a moment of silence for the steamers who had run out of steam. This was a tribute to the people who we lost this year. Unfortunately, there have been quite a few of them and many of us missed their presence a lot. Then there were a few announcements such as the good news that we would be back at the McClellen Conference Center next year, followed by the Ron Brown Memorial Steamup Enthusiasm award. This year's very deserving recipient was Phil Oldenhage, who seemed truly surprised and humbled. The door prizes were handed out next, with many humorous accusations of inside fixing. There were many AML cars given away, gift certificates for hotel rooms at Lions Gate, and a pass to next year's National Summer Steam up. What could possibly be more useful? Each of the participants from the Dealer room were nice enough to provide something to be given away.

After the festivities, the Saturday night steaming was quite active, and even as late as 10:00 there were a group of kids being entertained by a collection of wind up trains, but you could see folks start to pile large stacks of equipment on the carts and head for the doors. The momentum had shifted. The end was near and it was time to start thinking about loading up and heading home. It was a little quieter and people were shaking hands and exchanging phone numbers as the night wound down.

Sunday morning there was a trickle of people coming into the hall for one last run before they loaded their trucks. Many stayed to help with tear down, which was also greatly appreciated, but then, it was over. The swap table had lost all but the tiniest gravitational pull and there was nothing left to keep everyone there. A six-hour drive and 360 days till the next National Summer Steamup was what lay ahead, but the memories of people laughing and the smell of steam oil will be ongoing. It's cheesy but it's true. Hope to see ya' all next year.

Remember that young steamer on the cover of SitG from the NSS 2011 coverage? Well Patrick McConnell has grown up a bit and is still running steam with a smile.

Phil Oldenhage was the recipient of this years Ron Brown Memorial Steamup Enthusiasm Award. Phil was commended for his annual cheerful contribution of his time and track at the National Summer Steamup.

DIAMONDHEAD

JANUARY 19 to 25 2020

◆ International Small Scale Steamup ◆

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◆ For more information and registration forms ◆
◆ visit http://www.diamondhead.org/ ◆

Workshop Project

Adjustable Track Support System

Text and Photos by Bob Winkel

A track builder must consider a number of options to determine the final design. Before building this track, I decided the following:

- My G scale railroad would be outdoors
- Used occasionally for the next five-ten years by old farts (and occasionally by grandchildren) to run trains pulled by live steam and battery-electric locomotives.
- Ease of installation and adjustability would be important considerations.

The final product is a sixty foot, double-tracked and elevated railroad. The shape is a triangle with 12-foot diameter curves and three eight-foot. straights. There is a small yard area, a simulated bridge "scene" and provisions for flat front buildings along one of the straights. However, it is the support structure that is somewhat unique and the focus of this article.

The Support Structure

The support legs for the track had to provide a strong, stable base, but I didn't want to use heavy concrete pedestals or 4x4 posts. A friend sent a picture, attributed to Larry Herget, showing a track support system based on concrete reinforcing rods (rebar) and wooden 2x2 cross-supports. This evolved into a design that uses rebar legs primarily as pivot points, with the lift coming from a half-inch threaded rod in the center of the support structure.

Another aspect of the design is the half-lap joints at each end of the long two-foot by four-foot beams. These support beams are locked together at the half-lap joints by the vertical rebar rods (**Photo 1**).

The track's height adjustability comes from the galvanized half-inch threaded rod. The rod is tightly clamped to the 2x2 cross member. By adjusting the bolt at the bottom, which bears on a treated 2x4, you can easily raise or lower each individual "trestle". With this design the rebar rods do not directly support the track; we'll discuss this in more detail later.

The treated 2x4 at the bottom is 12-inches long and offers a "footprint" of about 18-square inches of ground contact. This size of footprint seems to be enough to support the weight of the track and does not seem to sink into the ground.

Designing the Track

I started the CAD design by drawing the two sets of rails, in this case an inner loop with an 11.5-foot diameter and an outer loop with a 12.5-foot diameter, both commercially available. The top deck was designed to be wide enough for the dual tracks.

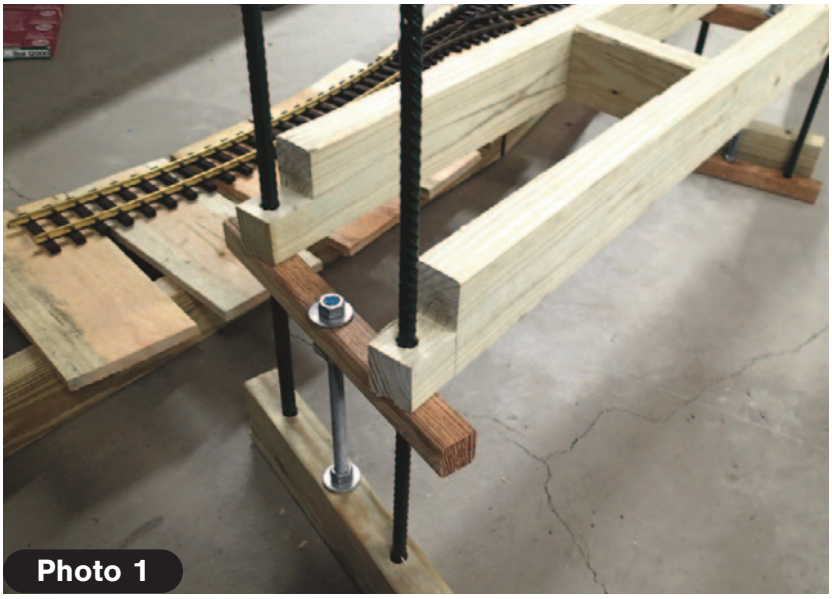


Photo 1

Here is a mockup of the support structure. The threaded rod in the middle adjusts the height of the upper 2x2.

The support beams, top deck and rails are each drawn on a separate layer in the CAD file (**Figure 1**).

In order to fit the spot behind the house, the track is configured as a triangle. Each 120 degree curve was broken into four 30 degree arcs. The three straights are each eight-feet long.

The lengths of the 2x4 beams (and the locations of the pivot holes) must be correct or the system will not go together correctly. The CAD program provided the dimensions for the various pieces. The drawing also included the dimensions for laying out the locations of the pivot points during installation.

Building and Installing the Track

Even though it's a relatively small track, things began to get a little cramped in there! The 2x4's for the beams were cut to length, the half-lap joints were cut and the pivot holes added. Each section went together fairly easily and even the 8-foot straights were not very heavy.

That spring, using the dimensions from the drawing, the center point of each curve was marked on the ground. During installation, the position of each pivot point was located using "radius links" to ensure proper placement (**Photo 2**). Once all the track sections were connected together, the rebar rods were pounded into the ground. They provide a lot of lateral stability.

When it came time to install the last beam into place, the rebar pivot point locations needed only minor adjustment before dropping the 2x4 beam into place. The track is presently constructed as a triangle but the modularity of the design means that it could easily have been configured as a circle, an oval, a triangle or a rectangle.

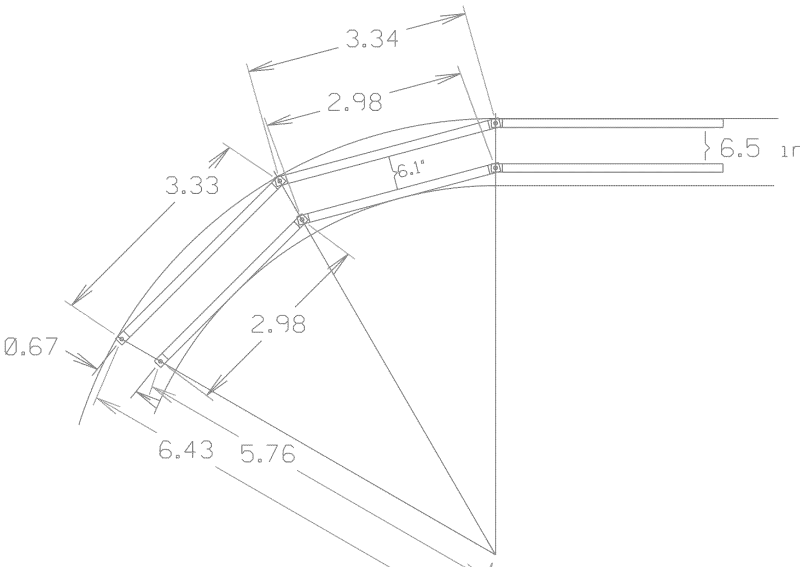


Figure 1. *Here is a portion of the CAD drawing showing.the length of the beams.*

Photo 2

This photo shows the radius links during installation. The rebar rods have not been pounded in yet.

The height of the track was definitely a concern. For preparing a steam locomotive, a taller deck is very helpful. But the stability of tall rebar legs was a concern. I opted for a lower height (about three feet at the high end). Steam engineers can sit while preparing their engines and junior railroaders like the height just fine. Observers in the adjacent screened porch can easily see all the

action, too.

The goals for the deck were:

- light weight,
- made of a renewable resource
- inexpensive.

I settled on pine fence pickets, which are approximately a half-inch thick and five and one-half-inches wide. Cutting deck pieces for the curved portion of deck required that each piece be slightly tapered to eliminate the gaps you get with rectangular top pieces. A fixture was made for the table saw to help cut the tapers consistently.

It took a little fiddling to get the two sets of rails installed. To provide a little visual interest, one straight section has a bridge feature. Another straight section is expanded to fit some sidings. The third straight has longer top boards to support several false-front buildings. A "step-over" stairs was added after the first season (**Photo 3**).

Leveling

Once the support structure was installed and the top boards were added it was time to level the track. The jack screws on every support make the process fairly simple. Each zinc-coated threaded rod is longer than needed, with the excess pressed down into the soil. A flat spot on the ground, in the middle of the track, was made for setting up a laser level. Using a laser makes it easy to see which supports need to go up or down. Usually, a few turns of the nut at the bottom of the "jack screw" is enough to get the support adjusted properly.

Cost

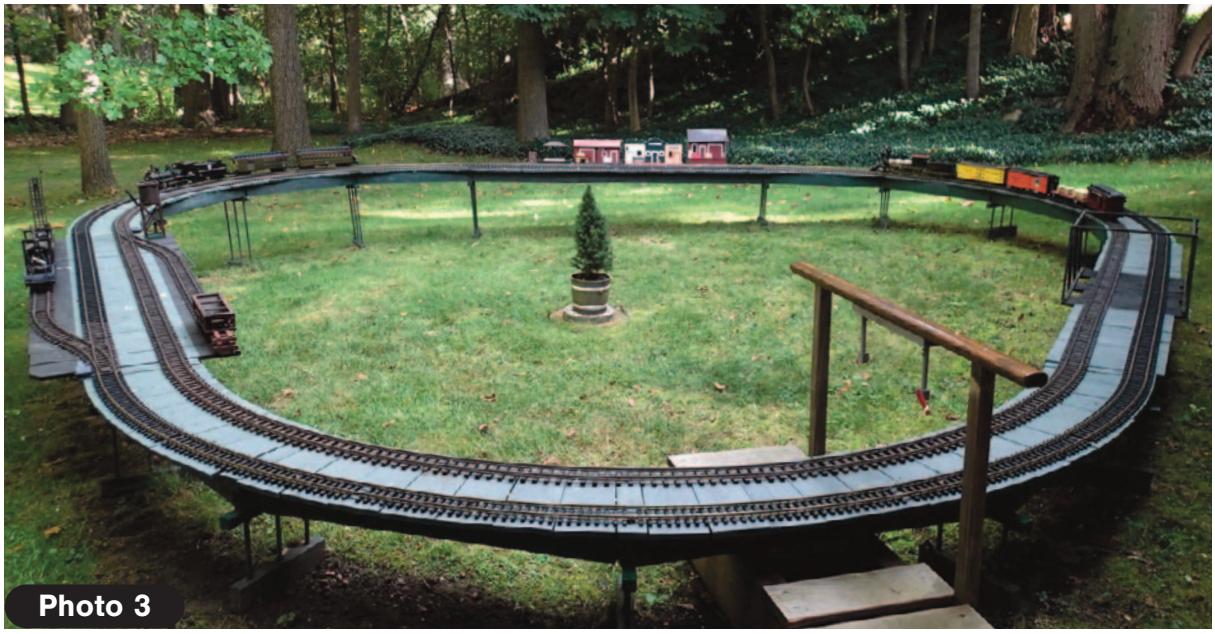
The cost for the structure itself, without the rails, totalled just over $500. And, there were no chiropractor bills after the construction. It can be removed fairly easily and reassembled elsewhere (it says here).

Conclusions

The support system seems to be holding up well. It is plenty strong enough to support the trains and accessories. It is pretty stable and only occasional slight adjustments have been required.

Of course, like every design, it is a compromise. There is no provision for elaborate garden railroading scenes. The live steam engineers wish the structure was taller. The track-to-track spacing is a bit tight for large scale (1:13.7) equipment. The yard tracks are too limited for extensive operations.

The track has been great fun for a number of visitors. The neighbors brought over their grandkids and modelers from two clubs have come to run trains. I enjoy taking pictures and there is enough visual interest, especially if you get in tight. It was definitively worth it.



Finished railway from above. In this photo you can see the recently added step-over stairs.

Scale Back Heads in small-scale live steam

Part 2 - A Commercial batch of 25 live steam locomotives in 1/32 scale

Text and Photos by Chris Tolhurst and Derek Pollard

Part 1 of this series, which appeared in *Steam in the Garden Issue 163 (September/October 2019),* described how the authors' mutual interest in detailed and accurate live steam models led to the rebuilding of two commercially produced live-steam Gauge One models, 1950's express locomotives of the "Britannia" Class (**Photo1**). Each was to include a prototypical, working back head in the cab. The result of this work, covering over 18 months in our spare time, more than satisfied our own aspirations, but it also led to a great deal of public interest when the locomotives were put on display at exhibitions and shows.

The thing that seemed to excite most people was the level of detail in the cab, and the fact that all the controls and gauges necessary to run the model were there in the cab, albeit disguised in one way or another. Feedback and customer demand indicated that a small batch of models built to a similar standard would sell well.

Photo 1

We had learned a great deal about constructing scale cabs from our rebuild of the Britannias. They weren't perfect and it was inevitable that the next project would take into account those imperfections. The lessons learned, and therefore the principles to be applied to the new model, were:

- *Choose a prototype with a relatively open cab for accessibility.*
- *Use an electronic water gauge and locate the LED indicators under a light proof flap.*
- *Hide the overscale working pressure gauge in the same location as the water level indicators.*
- *Use split manifolds and pipe looms (and NOT nuts, nipples and unions) wherever possible!*
- *Hide working valves under the cab floor where appropriate.*
- *Make access to running controls and access for maintenance as easy as possible.*

But first the prototype had to be chosen. It had to have a relatively open cab but it also had to be a popular, and therefore commercial, locomotive. To give it an even bigger potential market, it also had to be internationally known. Additionally, we wanted a prototype where at least one of the class had survived into preservation.


Photo 2

The decision turned out to be a simple one. The Southern Railway "King Arthur" class (**Photo 2**) ticked all the boxes. In addition to the criteria mentioned, it was a long-lived locomotive (in service 1912 - 1964) with many variants and liveries, so customers' orders could be personalised. And one example had survived into preservation, always a bonus when modelling a prototype. The building of a batch of 25 models was announced informally and within three weeks


Photo 3


Photo 4

the waiting list was full and deposits received. In fact, soon after there was another list of potential customers waiting for drop outs from the main list!

Building a prototype model before committing to production

The first thing to do was spend time pouring over works drawings, and a few hours climbing over the surviving member of the class (*Sir Lamiel*) measuring everything in sight (**Photos 3 & 4**). This is particularly important for getting details within the cab environment; back in the days of steam (and even now) photographers rarely took the trouble to take pictures of cabs, preferring endless front three-quarter views with as much steam coming out of every part of the locomotive as possible!

At the same time, work started on a prototype model. With so many innovations it was essential to test all these ideas before laser cutting, etching or casting any parts for the production run. The prototype was built with no unnecessary detail. It was merely a vehicle to test building processes, determine pipe run dimensions, identify wear points etcetera. As such it achieved its purpose well.

As far as the cab was concerned the design philosophy was to mount most of the working valves and gauges under the cab floor, or hidden in the opening lockers on each side of the cab (**Photo 5**).

The exceptions would be the regulator and the cylinder drain control both of which would be positioned exactly as per prototype. This worked very successfully on the prototype.

In addition it was decided to have all the boiler bushings at the front of the boiler inside the smokebox (**Photos 6 & 7**). Doing this minimised any intrusion into the cab by bushings and pipes on the back of the boiler. On the back of the boiler there was only a "dog clutch" (see **Photo 7** inset), which locates the regulator valve inside the boiler with the regulator handles on the dummy back head. By this means there was the added advantage that by having a manifold connection within the smokebox and no connections at the rear, the boiler could be removed from the model in a matter of minutes by undoing a couple of screws under the smokebox.

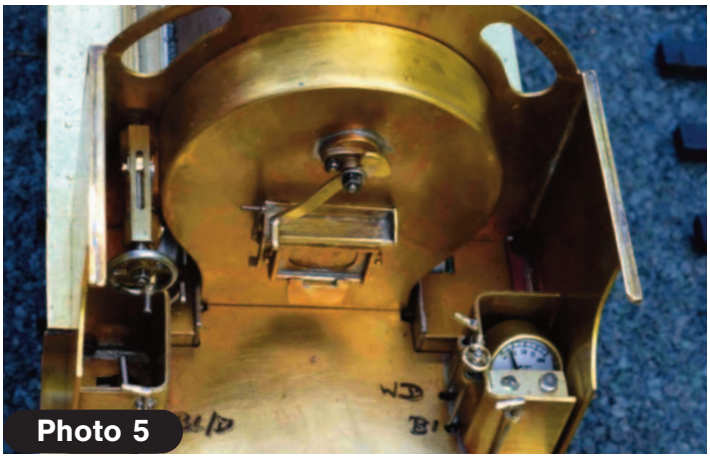


Photo 5

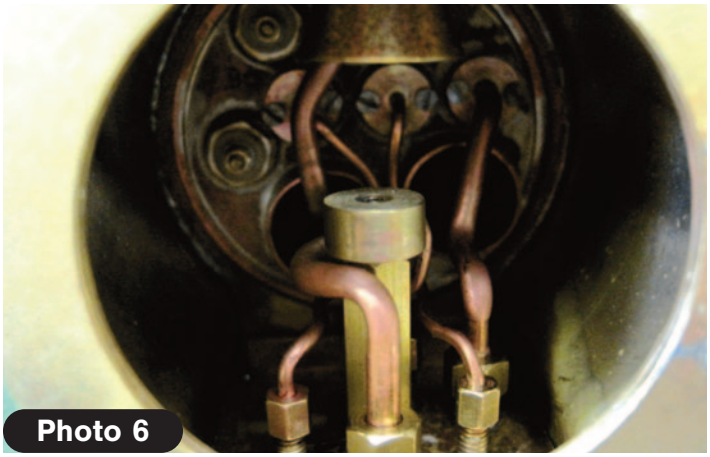


Photo 6


Photo 7

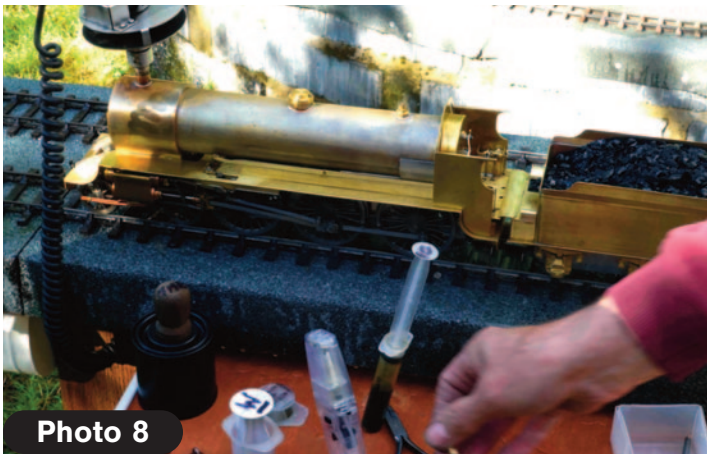


Photo 8

Photo 9


Photo 10

After reviewing all the details and measurements made from the inspection of the real thing (including cab details) a list was compiled of all the patterns that would be required. It amounted to 68 patterns in all.

While the prototype was being built and tested, (**Photo 8**), the patterns were produced and test castings made. Some are shown in **Photos 9 and 10**. The wheel castings had been turned, so as the test castings arrived the prototype could be completed and evaluated.

In **Photo 11** you can see the frames carrying the pipe runs and the under-floor valves. So let's have look (**Photo 12**) at the under floor valve units and pipe looms in more detail because they were the key to successful implementation of a scale cab.

The right hand unit contains three valves (**Photo 13**). The inputs (1) and outputs (3) are all on the left hand side and are connected to the frames with O-rings. This assembly is below the cab floor but the LED bracket and pressure gauge stick up into the right hand locker. The input is taken directly from the boiler, so it is also used for the pressure gauge.

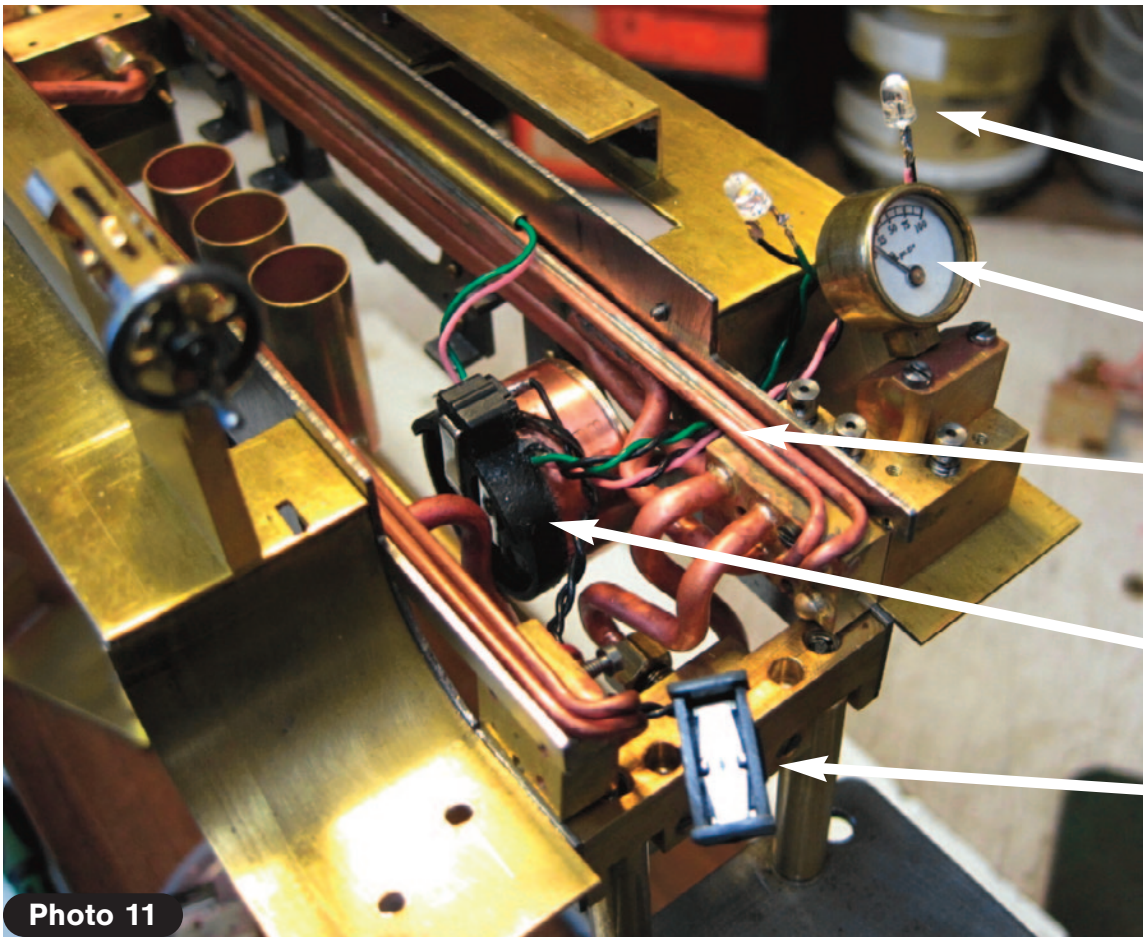


Photo 11

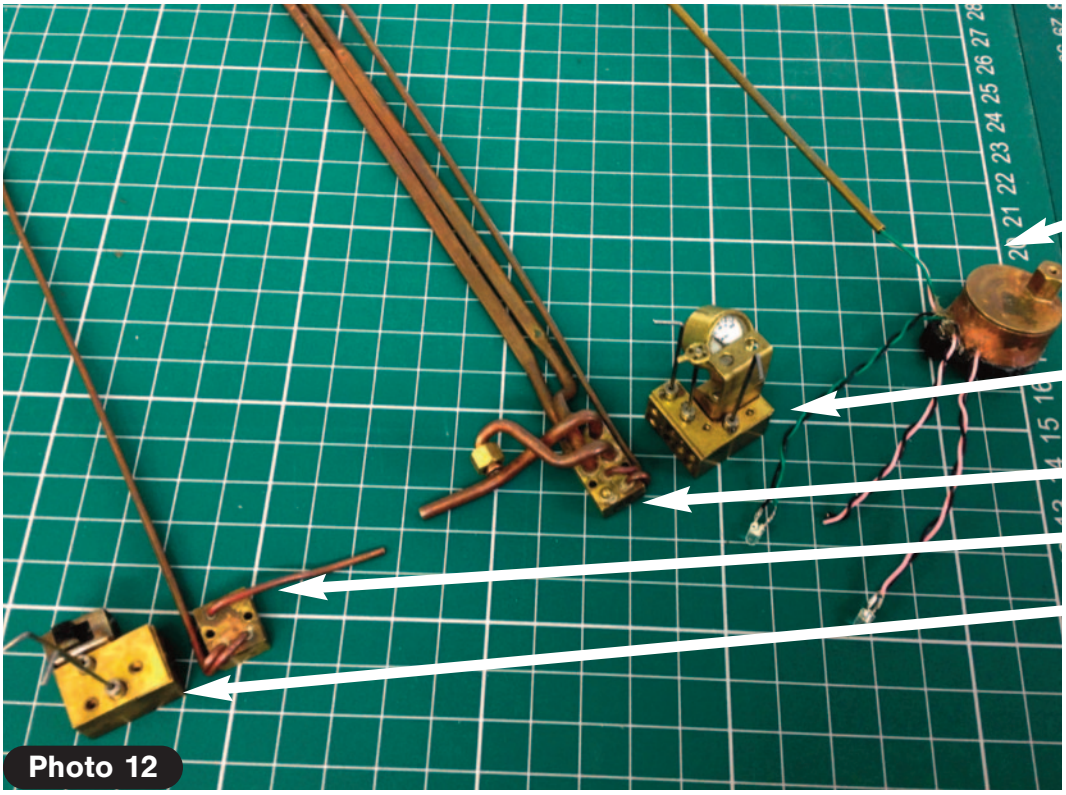


Photo 12

Between Frames
Battery, Water gauge, and Circuit Board

Right Hand Locker Under Cab Floor
Pressure Gauge, LED's & three Control Valves

Between Frames
Pipe Loom 2

Pipe Loom 1

Left Hand Locker under cab floor
On-Off Switch and two Control Valves

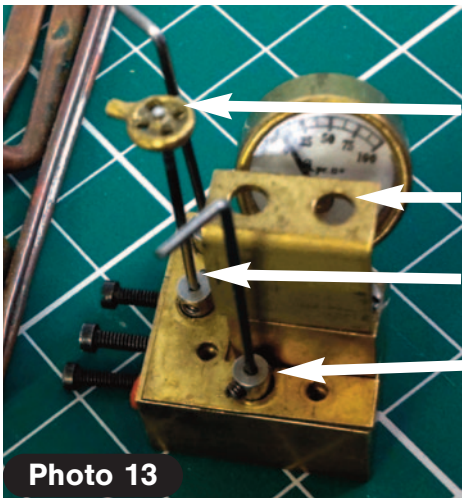


Photo 13

Boiler Drain

Water Level LED holes

Axle Pump By-pass

Lubricator Boost

There is a similar unit on the left hand side (**Photo 12**). This time there are two valves, one for the blower and the other for the blower drain. Inside the left hand locker is an on-off switch for the water gauge electronics.

Once the cab layout and valves had been thoroughly evaluated on the prototype, work could commence accumulating parts for the production run.

There is no short cut on this; it means a great deal of work, and despite employing as many production engineering tools as possible (especially jigs), the accumulation of parts, assembly and finishing took close on two years.

Photo 14 shows the 25 right hand valve units finished and waiting for final assembly. These working controls were added to the frames as part of the rolling chassis construction process. The non-functional/visual detail parts of the cab, however, were designed to be a cosmetic overlay, added at the very end of the construction.

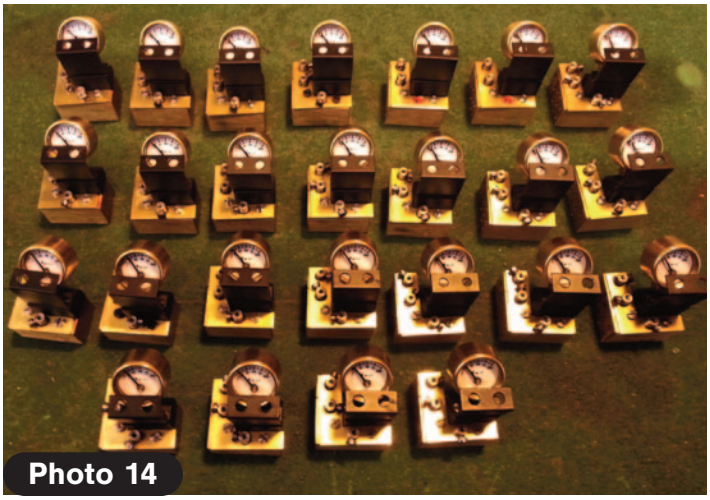


Photo 14

Into production

The detailed back head started with construction and painting of the basic back head structure (**Photo 15**). Each back head consisted of five etches; a base, a back head with etched holes for boiler fittings, a wrapper, and a surround, all soldered together. There was also a back plate and firebox door, attached later.


Photo 15

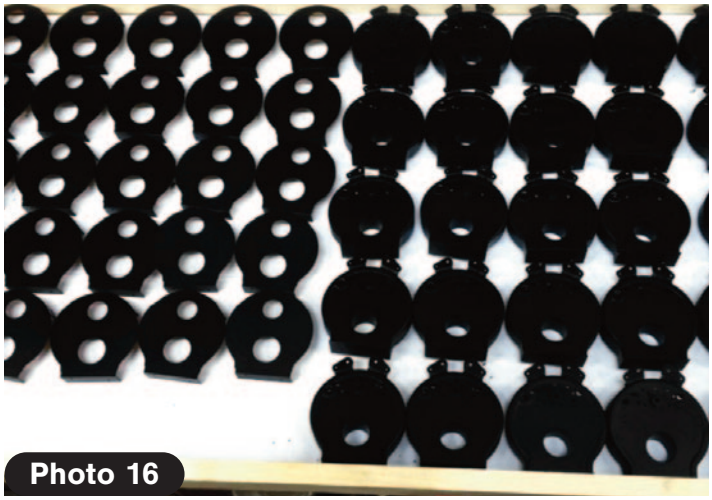


Photo 16

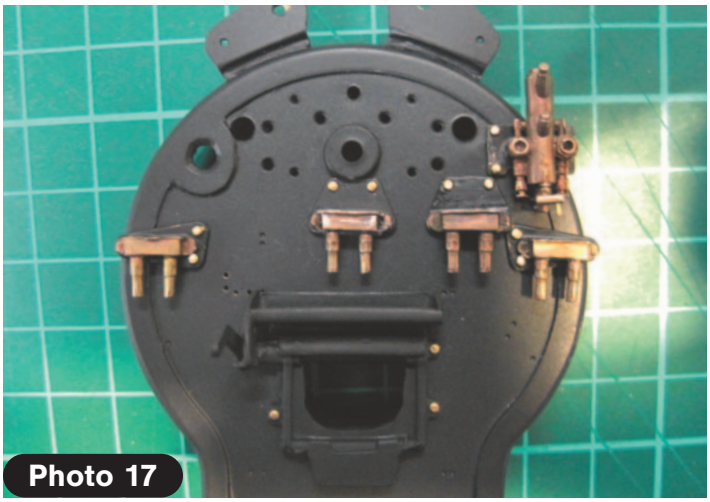


Photo 17

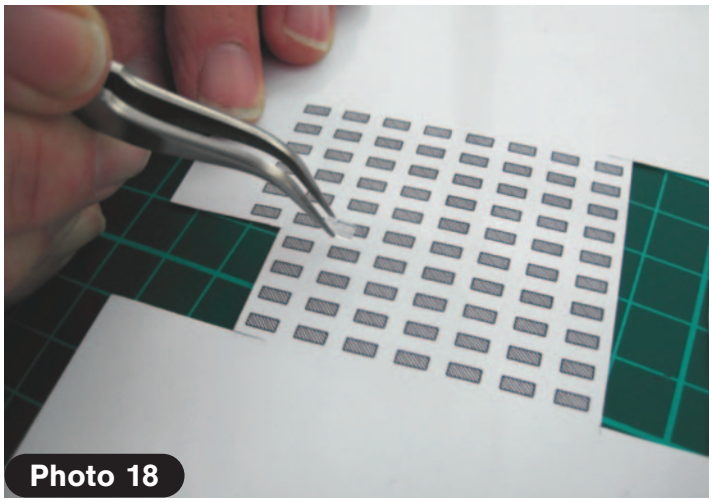


Photo 18

These were stove enamelled black (**Photo 16**) and then the detail added piece by piece, back head by back head (**Photo 17**).

Many of the back head fitments required novel approaches, simply because such a level of detail in the hostile live steam environment had rarely been attempted, if ever.

The scale water gauge safety glasses for instance. 3mm square section Acrylic was not available so 4mm square section rod had to be milled down to 3mm, repolished and then a 1mm slit milled down its length. Short lengths of this, now, "U" section rod, could then be stuck onto a paper representing the striped water gauge backplate, and cut out (**Photos 18 & 19**). The paper over the 1mm slot now had to be removed with a surgical scalpel so that the glass would fit over the water gauge casting (**Photos 20 & 21**). A perilous time for finger tips!

Continued on page 30

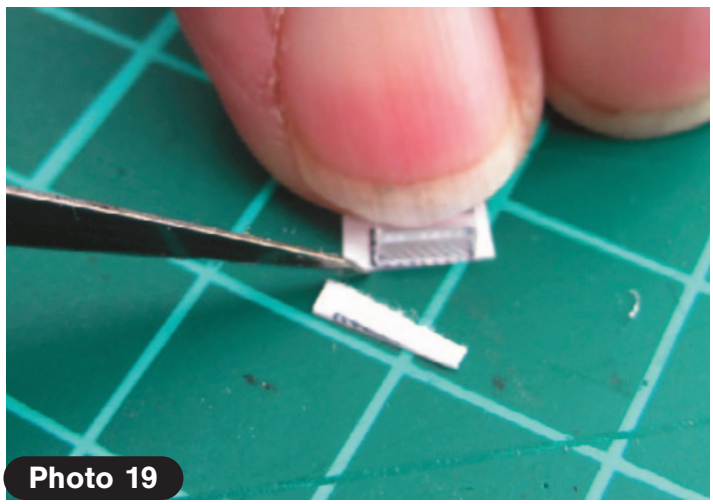


Photo 19


Photo 20

ACCUCRAFT TRAINS
ELECTRIC & LIVE STEAM MODELS

SOUTHERN PACIFIC P-8 CLASS 4-6-2

Engineering Sample Shown

1:32 Scale, 45mm Gauge
Alcohol Fired, Butane Ceramic Fired, Electric
Available in #2467 and #2472
$3,995.00 each, Delivery Winter 2019

ASTER LNER THOMPSON CLASS B1

ASTER HOBBY

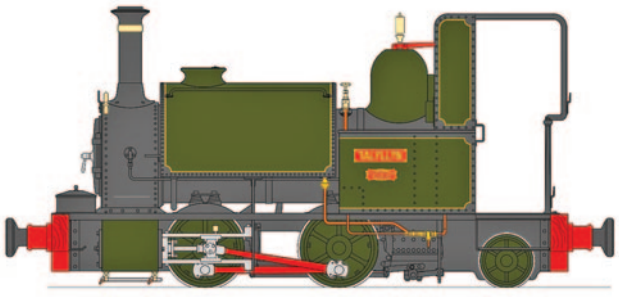
Engineering Sample Shown

1:32 Scale, 45mm Gauge, Alcohol Fired
Available in Green, Black, and BR Black
$3,100.00/KIT, $3,600.00/RTR

CIWL SLEEPER CAR - "TRAIN BLEU"

1:32 scale, 45mm Gauge
Brass & Stainless Steel Constructions
Ball Bearing Trucks, Detailed Interior with Battery Lighting
$950.00 each

'TALYLLYN' 0-4-2ST



1:19 Scale, 32 / 45 mm Gauge, Butane Fired
Available in TR Green, Indian Red, Black
Taking Reservations, Delivery Spring 2020
$1,700.00 each

Price is FOB Union City, California. Items subject to change in price, color, specification design and availability without notice.

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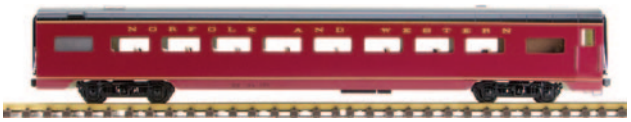
ACCUCRAFT TRAINS
ELECTRIC & LIVE STEAM MODELS

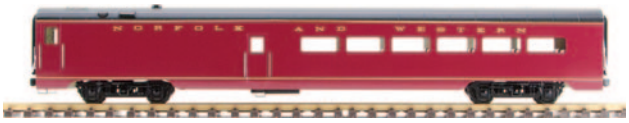
NORFOLK & WESTERN 4-8-4 J-CLASS #611

1:32 Scale, 45mm Gauge, Alcohol Fired
$5,950.00 Live Steam, $5,250.00 Electric (Delivery Sep./Oct. 2019)

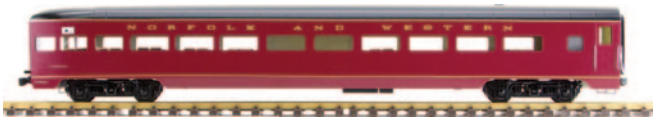
SMOOTH SIDED MODERN PASSENGER CARS


Coach


Baggage Car


Diner Car


Pullman Sleeper Car


Observation Car

1:32 Scale, 45mm Gauge, Die-Cast Trucks, Metal Body
Available in Unlettered, Southern Pacific, Union Pacific, New York Central, Norfolk & Western, and Canadian Pacific
$340.00 / car, $2,040.00 / 6-car set

Bundle Offer: $1,530.00 / 6-car set with purchase of J-class.
Limited time offer. While supplies last

SR & RL FORNEY #6 AND WW&F FORNEY #9

1:13.7 (7/8ths) Scale, 45mm Gauge
Butane Ceramic Fired
$3,200.00 each, Delivery Nov. 2019
Inquire with us about rolling stock kits

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1:32 Scale, 45mm Gauge
Butane Fired
$1,945.00 / Kit, $2,160.00 / RTR

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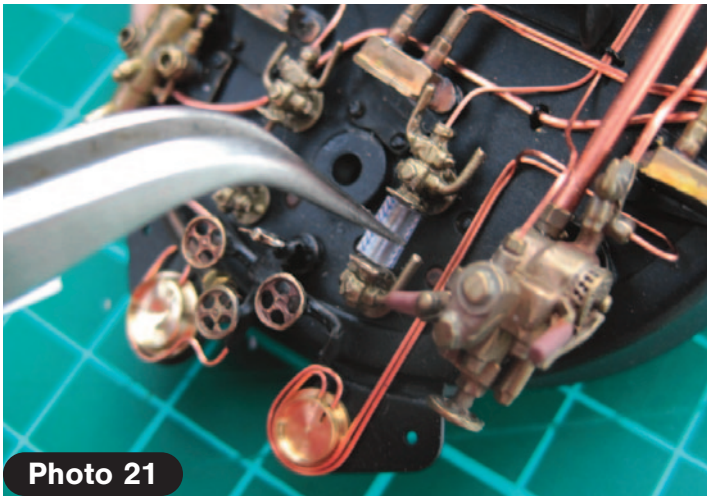


Photo 21


Photo 22

The dials for the gauges also required a novel approach. These were reproduced on photographic gloss paper and had to be cut out as a perfect circle to fit in turned brass gauges only a few millimeters across. Not a job for scissors! Special punches were turned to use in conjunction with an optical punch (**Photos 22 through 26**).

Completing all these detailing parts enabled the sub-assembly of the back head and seats to be produced. First the back plate and ceramic insulation was added (**Photos 27 & 28**).

Then the back head could be added to the floor and seats. Painting and weathering were then carried out (**Photo 29**). The regulator lever was not added until the sub-assembly was mounted on the locomotive.

Once added to the locomotive, the model was almost finished (**Photo 30**), and dare we say it, the


Photo 23


Photo 24


Photo 25

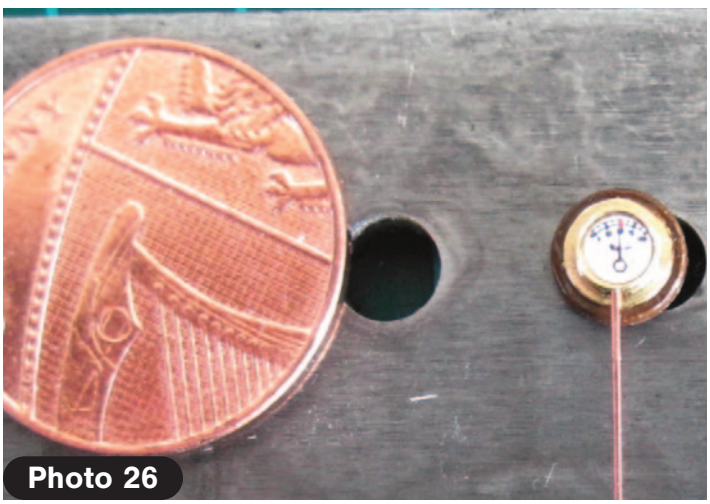


Photo 26

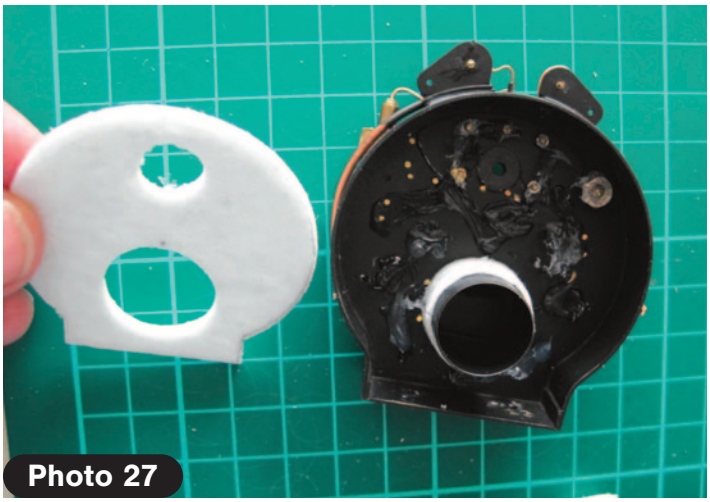


Photo 27

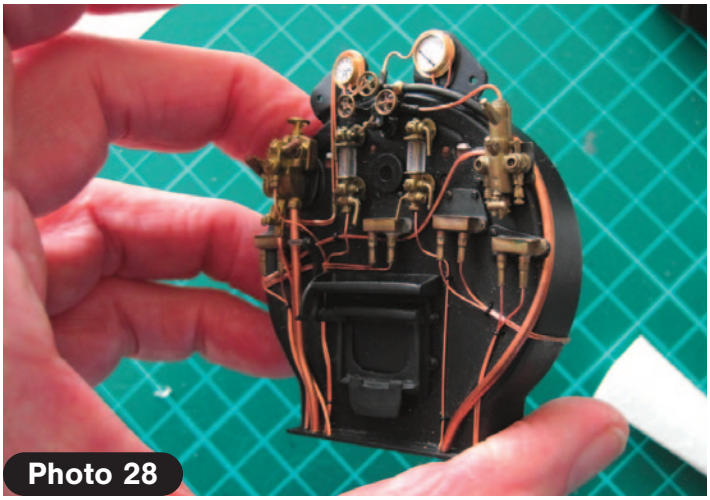


Photo 28

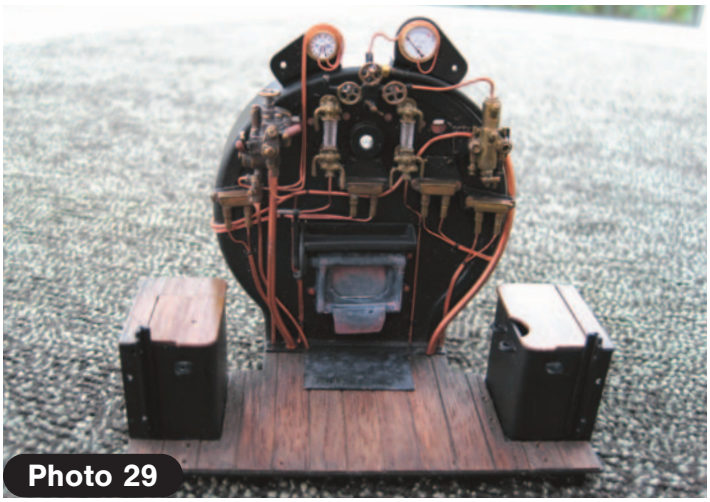


Photo 29


Photo 30

complete thing looked pretty good. All that was needed for a completely authentic cab was a crew. These were provided as painted bronze castings, cast from 3D printed patterns (**Photo 31**)

The run of 25 highly detailed models with scale working cabs was by any definition a great success. But producing this level of detail is inevitably time-consuming and expensive. Our conclusion would be that not every model is a suitable candidate for this level of accuracy.

Enclosed cabs in particular make the exercise rather pointless. Also, we all know that there are occasions (public running with less than careful colleagues?) when a rough and ready model is more appropriate; one you don't mind getting a few scratches on! Both of us own models with non-scale cabs but building models occasionally to the level of detail seen on these King Arthurs is incredibly satisfying. And we shall keep doing it. Watch this space for a beautiful Victorian express locomotive now under development!!


Photo 31

A FREELANCE HEISLER YOU CAN BUILD "FROM THE GROUND UP"

Part Six

Text, Drawings and Photos by
Les Knoll, P.E.

Freelance Heisler Construction Series

Part 1 - Intro, trucks
Part 1 Addendum - Machine-free trucks
Part 2 - Building the frame
Part 3 - Assembling, modifying and mounting the PM Research engine
Part 4 - Smokebox
Part 5 - Plumbing, Boiler modifications and steam testing
➔ Part 6 - Cab and bunker, misc details and wrap-up

We've come to the end of our Heisler building adventure. Seems there's been a lot of press on Heislers lately. There was the Accucraft review last month as well as Pat McConnell describing how he brought an Accucraft Heisler back from the dead. My Heisler construction articles have been going throughout 2019 and add to that two back-to-back cover shots of Heislers (I like the second (current) one better, hahaha) so this last year has truly been the year of the Heisler.

What started it all had to have been Bill Allen's series on building his fantastic four-banger Heisler back in 2014. That's probably what put me over the edge to build mine, and to document it so others could, too. That, and revisiting Sean Tower's ground breaking Heisler project using the PM Research engine with a Ruby boiler.

If you are keeping up with these articles in the construction of your Heisler, you now have a full steaming chassis with a detailed boiler and framework. Hopefully you are enjoying running it. The first one I built was left in that stage for weeks while I broke it in and ran numerous performance and evaluation tests. OK, I just enjoyed running it, too! I watched the locomotive chassis improve in performance with break-in, becoming smoother in operation and more powerful. Since this was the prototype or 'proof of concept' chassis, any design bugs were worked out and building techniques were improved upon before its construction was documented. Some changes were made even during publication; two very different methods of building trucks were described.

This chassis with a makeshift cab and bunker, along with geared trucks 'borrowed' from my Climax locomotive, had its 'trial by fire' at Diamond-

head 2019. The fledgling locomotive was well received and steamed flawlessly. It was run manually and with one and two channel radio control.

This chassis was later turned over to Scott McDonald, Mike Moore, and Mike McCormack for detailing and addition of final sheet metal work, the areas of construction which are described here. To make sure the design was reproducible, I built a second chassis directly from the plans published here, but with a sheet metal superstructure and detailing more closely following the construction of West Side Lumber Co. Heisler No.3. This is no different than an auto maker having a basic chassis onto which they build coupe, convertible or SUV models. This second build proved out the construction methods and confirmed that subsequent locomotives would break in in a predictable manner.

Full sized template drawings are provided for the cab and bunker for the Borate and Daggett prototype Heisler. These can be transferred to full size Avery labels by use of a copy machine as described in previous articles and cut out with shears and rotary tools in the same way the smokebox base was constructed.

A number of cab and bunker parts may be obtained from Denver Waterjet, 3865 N. Highway 16, Denver, NC 28037 (denverwaterjet.com (980) 222-7515). Contact Mr. Peyton Smith and ask for the parts in the folder "Les Knoll Heisler Cab-Bunker DXF Waterjet Files." They have cutting data available for parts CB-1 through CB-4, CB-6, CB-7 and BK-6.

The cab parts CB-1, CB-2, CB-3 and CB-4 are soft soldered together with full-length vertical seams as shown in Cab Sub-Assembly CB-15, (**Drawing 6-1**) . CB-3 and C-4 are soldered flush to the inside of CB-1 and CB-2. CB-3 is at the front of the cab and CB-4 is at the back. The edges of CB-3 and CB-4 can be pre-tinned as well as the portions of CB-1 and CB-2 to which pieces CB-3 and CB-4 will be attached.

After tinning, smooth some flux on CB-1, position CB-3 on top of it and heat with a torch until the solder on both pieces melts, then position CB-3 and hold it in place as the solder cools. Use a square as a guide when positioning the cab components. Repeat the process for CB-1 and CB-4, then do the other side of the cab with CB-2, CB-3 and CB-4. Make sure the assembly up to this point is square. The two pieces CB-6 are soldered to the sides of the cab as shown in the Cab Sub-Assembly CB-15. Make sure you get the orientation of the cab sides right; if you don't, the cutout for the lubricator drain won't line up. The lubricator drain cutout is in CB-2 on the left side of the cab, 1.938-inch from the front of the cab. Also note on CB-3, the 0.562-inch cutout is on the left side of the cab.

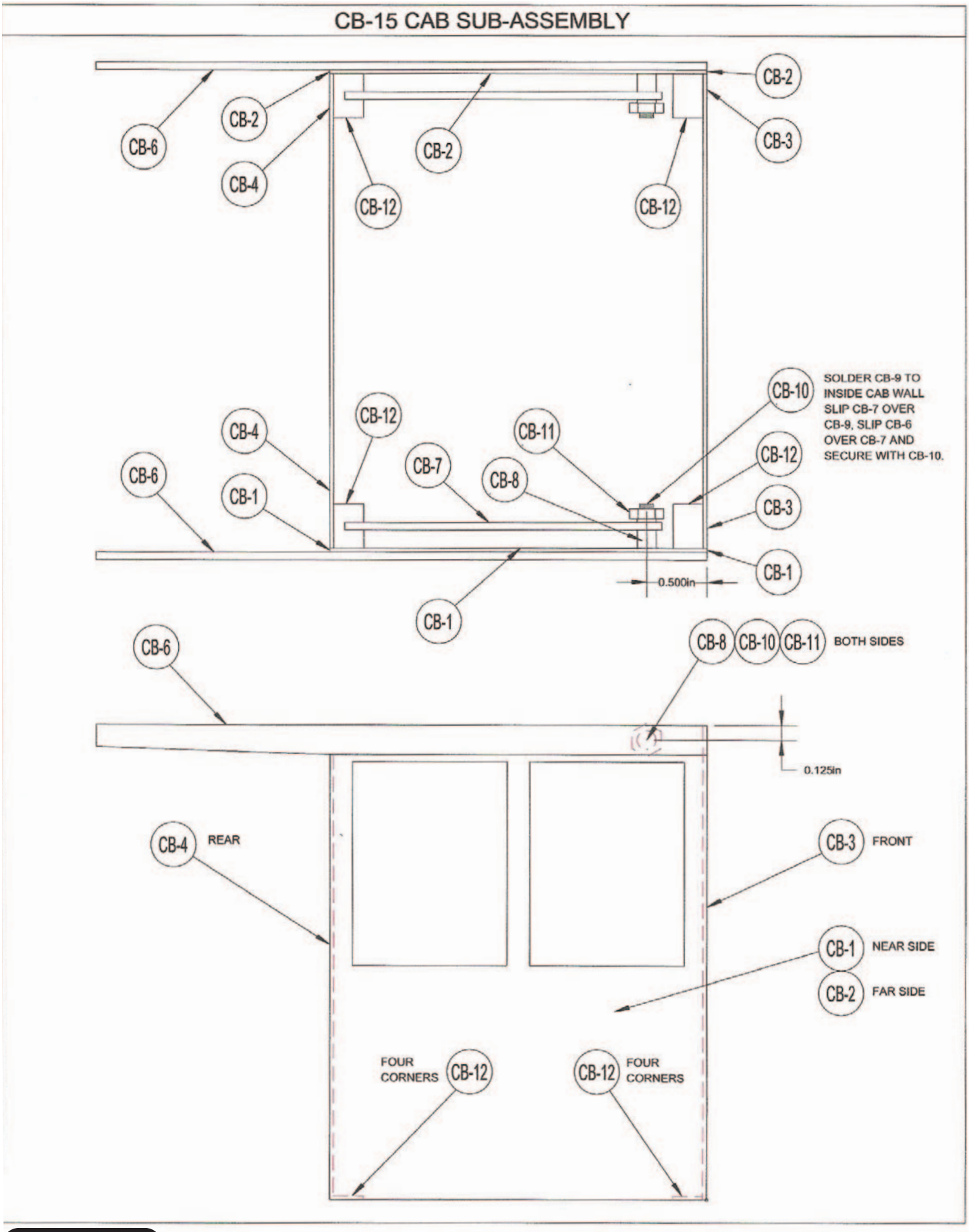
CB-7, CB-8, CB-10 and CB-11 make up the two cab roof arm assemblies, one on each side of the cab. Parts CB-10 are brass screws because they are soldered to the cab sides. The heads are ground down so there is some flat surface to mount to the cab sides. Pre-tinning of the screw heads and cab sides and then joining is recommended, similar to what was done with CB-1 through CB-4. Make sure to localize the heat so as not to unsolder CB-6. Attaching small "C" clamps to CB-6 in a couple locations can act as heat sinks.

The cab roof CB-5 can be formed by hand using wood dowels. In forming, add several inches of additional material on either side of what is actually needed for the roof to handle the roof piece during forming. This will be sheared off when the desired shape is obtained. Two tapped tabs CB-9 are soldered on for the mounting of the cab arms CB-7.

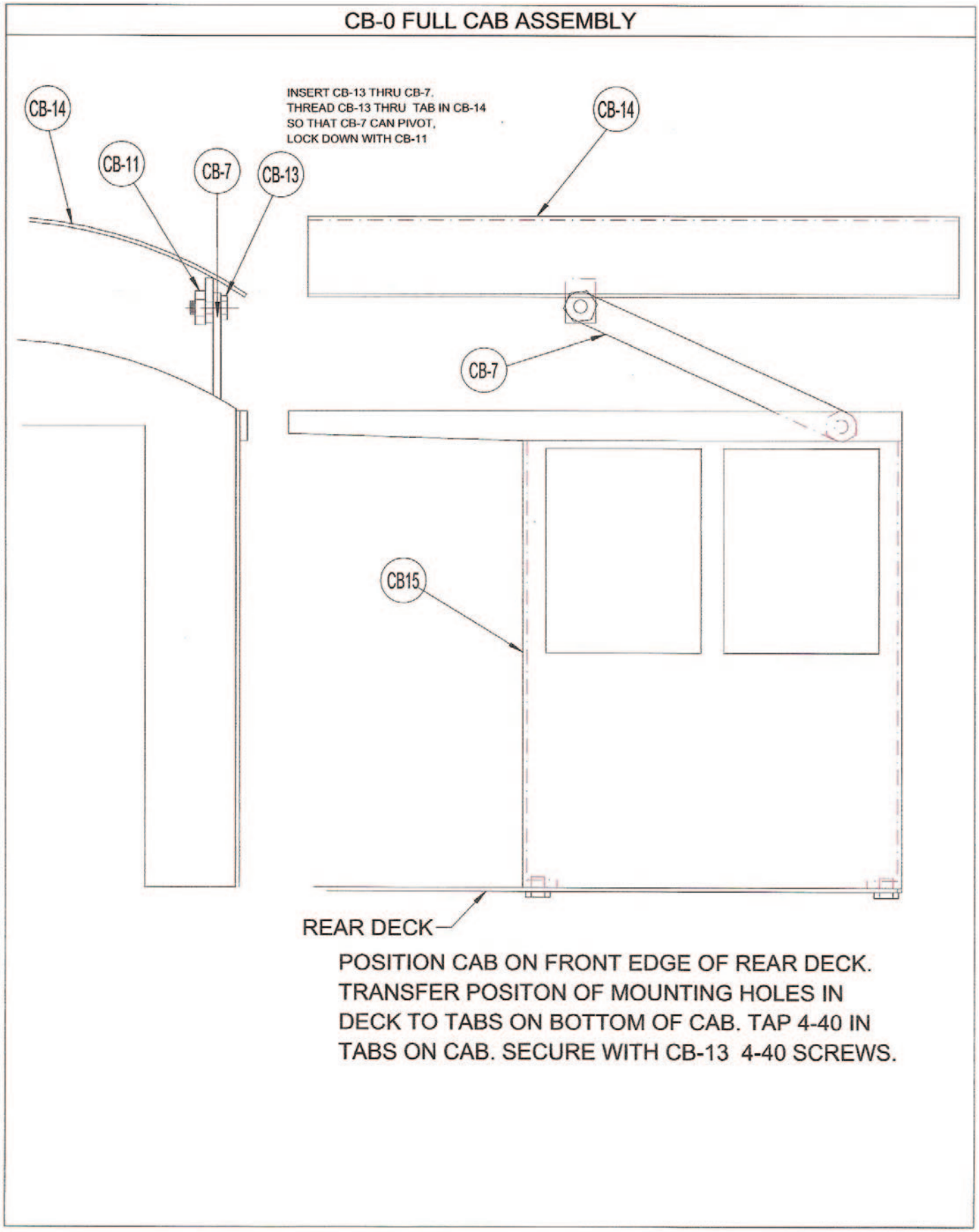
CB-0, the Full Cab Assembly, (**Drawing 6-2**), puts all the cab parts together and gives instruction for mounting the cab to the mainframe. You may have to make some fit-up adjustments in the swing arm system that mounts the cab roof. Once adjusted, this is a very handy system for lifting off the cab for servicing or manual running.

The four tabs CB-12 on the bottom of the cab are not initially tapped. To determine the location of the mounting holes, locate the cab on the front edge of the rear deck as shown on CB-0, and transfer the mounting hole locations in the deck to the tabs on the cab assembly. The tabs are then tapped and the cab mounted with 4-40 screws CB-13.

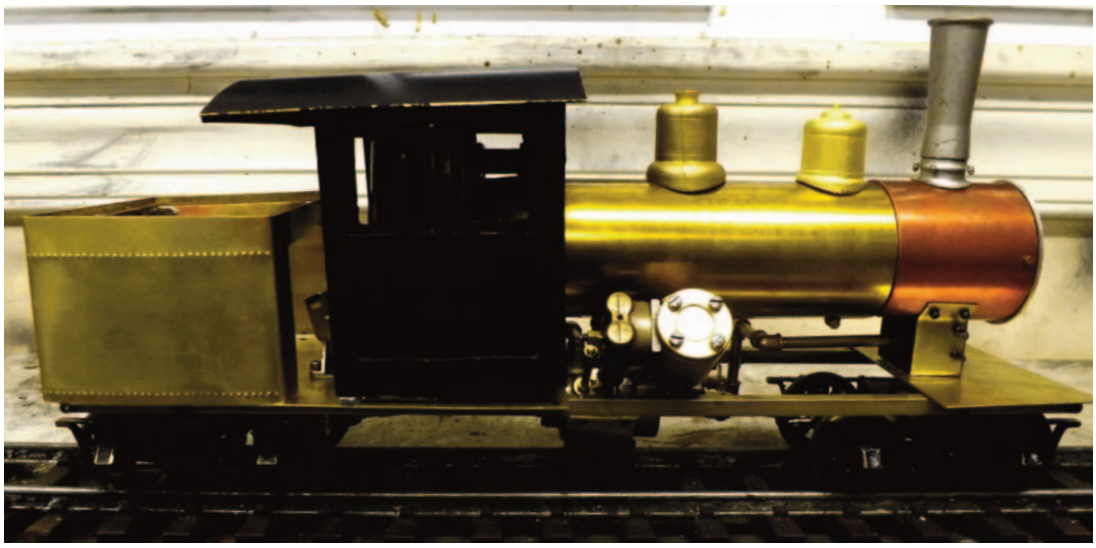
The bunker follows the same basic construction techniques as the cab, except that the bunker sides and ends are embossed to simulate rivets as was done for the smokebox. There is no left hand and right hand for the two parts BK-1. Flip the part over, and you have the opposite hand. The bunker material is thicker than what was used for the smokebox and a heavier punch setting will be needed to 'punch' the rivets. The rivet detail may not be as fine as that on the smokebox because of the thicker material used.


CB-15 CAB SUB-ASSEMBLY
CB-2
CB-6
CB-2
CB-4
CB-2
CB-3
CB-12
CB-12
CB-10
SOLDER CB-9 TO INSIDE CAB WALL SLIP CB-7 OVER CB-9, SLIP CB-6 OVER CB-7 AND SECURE WITH CB-10.
CB-12
CB-4
CB-11
CB-7
CB-6
CB-8
CB-12
CB-1
CB-3
0.500in
CB-1
CB-1
CB-6
CB-8
CB-10
CB-11
BOTH SIDES
0.125in
CB-4
REAR
CB-3
FRONT
CB-1
NEAR SIDE
CB-2
FAR SIDE
FOUR CORNERS
CB-12
CB-12
FOUR CORNERS

Drawing 6-1


CB-0 FULL CAB ASSEMBLY
INSERT CB-13 THRU CB-7,
THREAD CB-13 THRU TAB IN CB-14
SO THAT CB-7 CAN PIVOT,
LOCK DOWN WITH CB-11
CB-14
CB-11
CB-7
CB-13
CB-14
CB-7
CB15
REAR DECK
POSITION CAB ON FRONT EDGE OF REAR DECK.
TRANSFER POSITON OF MOUNTING HOLES IN
DECK TO TABS ON BOTTOM OF CAB. TAP 4-40 IN
TABS ON CAB. SECURE WITH CB-13 4-40 SCREWS.

Drawing 6-2



Pacific Coast Borax Heisler Cab in place on the author's prototype.

Roll the individual bunker sides BK-1 with wood dowels of a smaller radius than called for on the drawings and straighten by hand. Use the bunker top BK-2 as a guide. Join the two bunker sides BK-1 together at the rear using the strip BK-5. If desired, a thinner strip for this particular BK-5 can be used to join the bunker sides. The fronts of the two parts BK-1 are soldered to BK-7 as shown in the Bunker Assembly (**Drawing 6-3**).

You have the option of making the bunker top BK-2 either removable or permanently attached to the bunker. If you make it removable, very handy for R/C control or batteries for lighting, solder in strips BK-5 at the top of the bunker. You can vary the height of these to taste, depending on the space you need in the bunker. BK-2 is then just placed on top of the strips BK-5 and left free. If you want to make the top assembly permanent, omit the strips BK-5 at the top of the bunker, position BK-2 in the bunker and solder it in.

The bunker rear BK-6 is cut by transferring the pattern from the drawing, or obtaining it from Denver Waterjet. It is bent so that its lower edge mates with the top edge of the bunker sides. This may take considerable hand shaping. When you are satisfied with the fit up, start at one end of BK-6 and solder a small portion of it at a time to the edge of the bunker sides. You might want to do a short strip, skip an inch or so, and do another strip, filling in the rest afterwards. You could also tin the edges of BK-6 and the top edge of the bunker and apply heat to fuse the two parts. The key here is apply heat gently to small areas at a time and solder only a small amount at a time. You want the heat localized so you do not re-melt in areas you have finished.

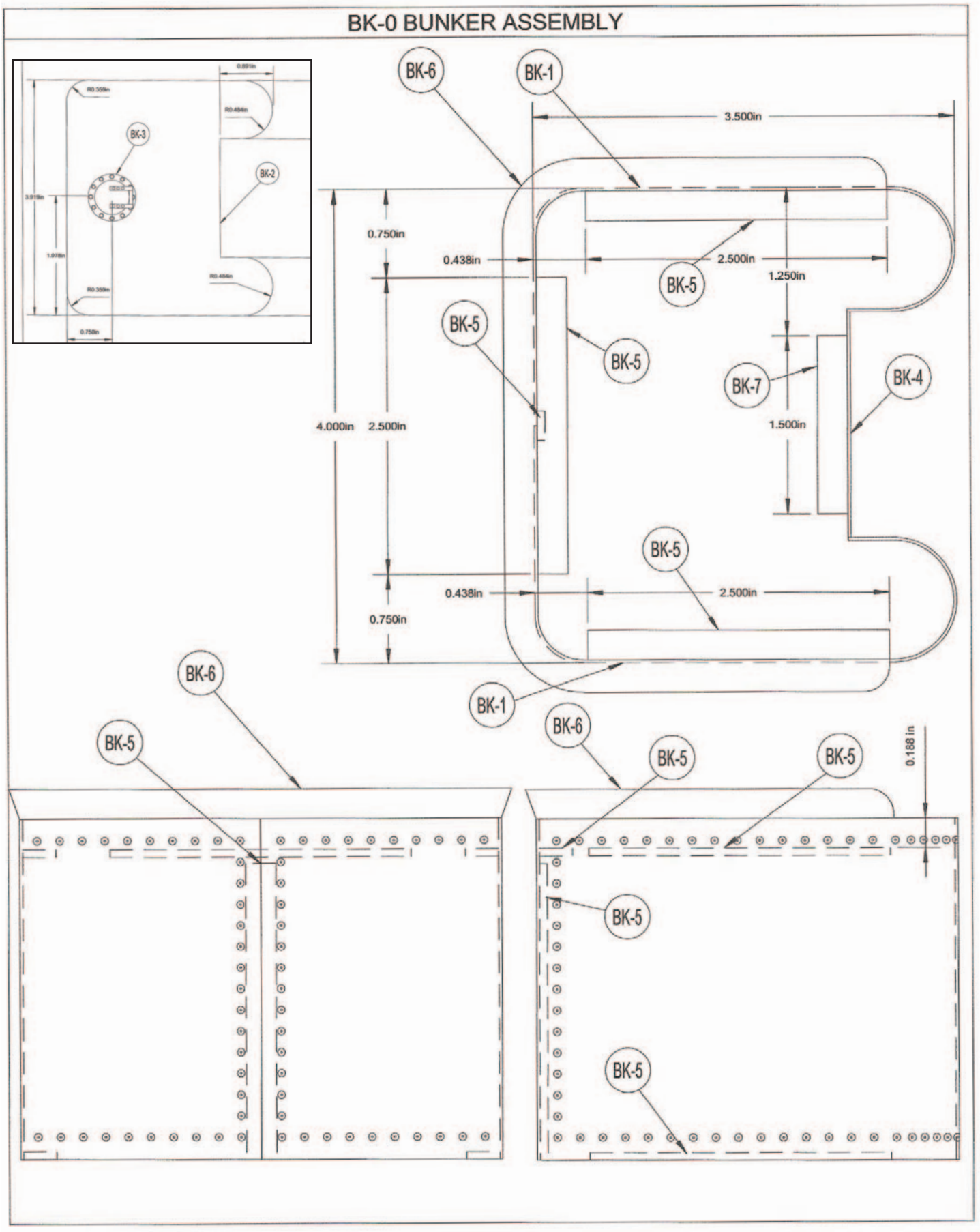
When the bunker is soldered up, it can be located on the mainframe just like the cab was. The mounting hole locations from the mainframe are transferred to the brass strips at the bottom of the bunker and the strips tapped 4-40 for mounting screws.

Painting the brass components can be done by degreasing and pickling the brass components in vinegar or light acid and, after drying, applying several coats of Krylon Colormaster Paint and Primer Matte Black No.3447. The color looks good and so far it has proven to be durable, although it's not the match for a baked-on finish. A high temperature paint like that used for painting automotive exhausts and engine blocks should be used for the smokebox.

Additional detail parts can be added to the bunker, limited only by the imagination of the builder. A water or oil hatch is shown on the inset to the Bunker Assembly (**Drawing 6-3**). You could also add a backing light, tool boxes and water shut-off valves. Trackside Details has dozens of details that can dress up the bunker and other parts of the locomotive, too.

The Overall Assembly Drawing (**Drawing 6-4**) puts it all together. It shows the assembled locomotive, calls out the major assemblies and shows a couple of the many details that can be added by the builder. Roundhouse supplies one boiler band with the boiler kit used in the Heisler, and additional bands can be made by the builder and installed as shown in the Overall Assembly. Running boards can be made by attaching brass strip supports to the boiler bands or wrapper and attaching actual wood or brass running boards to the strips.

My Heisler has been in operation for nearly a year now, and has had no mechanical difficulties. It is the exact same chassis as described in the construction articles, but dressed up as West Side No.3. After the 10 hour break-in, both of the chassis I built ran equally well and were strong runners


BK-0 BUNKER ASSEMBLY
BK-6
BK-1
3.500in
0.750in
0.438in
2.500in
1.250in
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BK-5
BK-5
BK-7
BK-4
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2.500in
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2.500in
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Drawing 6-3

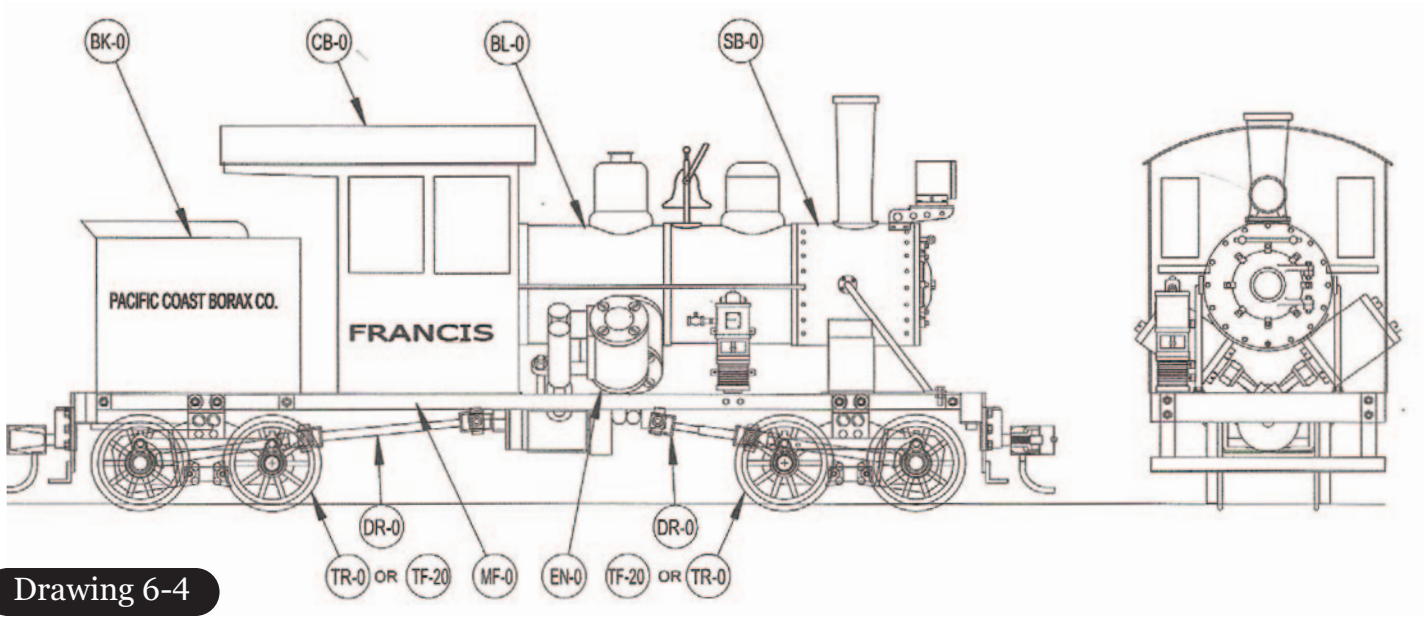
and great pullers. At a recent open house on my Rivendell & Midland Railroad, the West Side Heisler pulled four large passenger cars and a six car logging consist, and walked away with all of them. This locomotive has been a joy to run.

This loco is also comparatively easy on the pocketbook. Tallying up all the costs to build, it cost approximately one third as much as the commercially available counterpart. Of course there are differences between the two, such as oscillating cylinders versus authentic Stephensons valve gear, but the freelance Heisler is a strong smooth runner in its own right and you soon forget this difference when it is in motion. The freelance Heisler has the advantage in that you can customize it to whatever prototype or scale you desire. I know of some modelers who are already building 7/8th-inch scale versions. I model in 22.5:1, so a 20.3:1 commercially available loco is too large for me whatever the cost. One more advantage of this loco is that you can build it in stages as time and finances permit. Did I forget to mention the satisfaction of building it yourself?

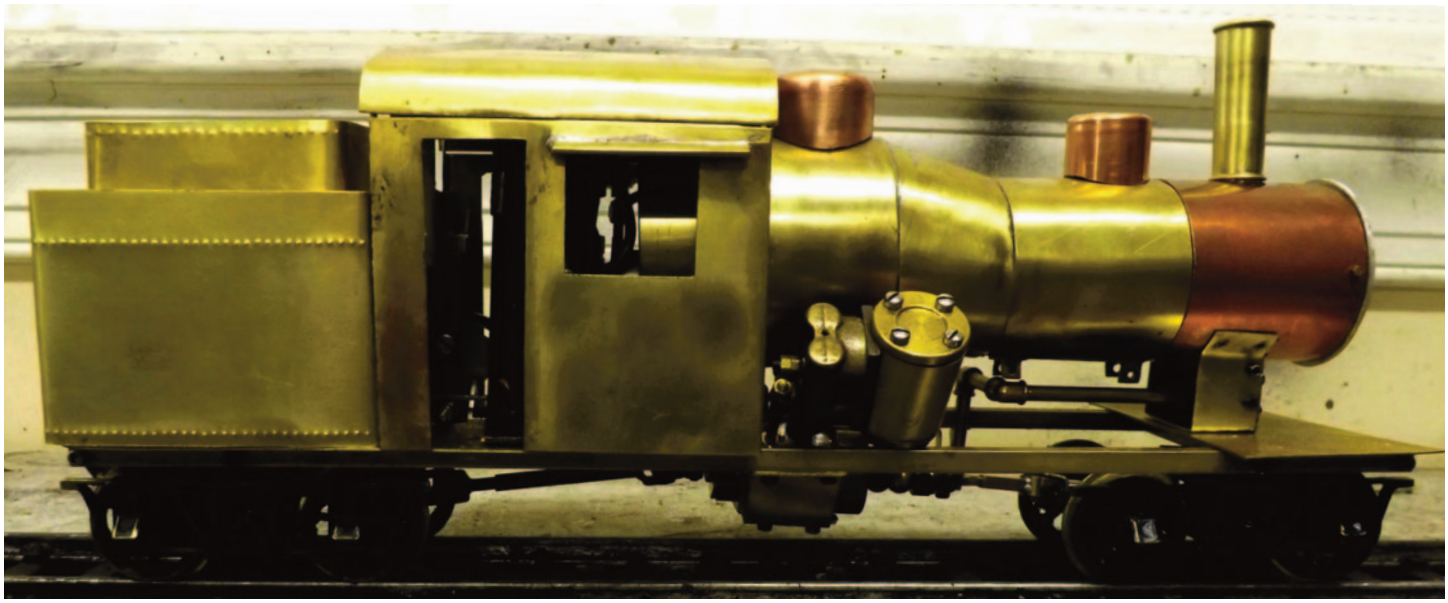
A couple of things to watch out for: When steaming up, the locomotive will seem to not want to run at all when you first open the throttle. The PM engine is a bit difficult to clear of condensate (its only flaw!) but after about a dozen back-and forth cycles on steam, it should clear and start running nicely. As I have mentioned previously, do not push it by hand, let the steam do the work. It is difficult and perhaps harmful to the drive mechanism to try to backdrive the engine assembly through 3:1 gearing. To minimize condensate lock, don't fill the boiler so full. I fill mine to about six ounces by filling to the brim and drawing out two ounces, which is taking out more than Roundhouse recommends, but the engine clears easier. Makes for a slightly shorter run, but you DO have a Goodall valve for refills!

Being powered by an oscillating cylinder engine, the starting from rest may be just a little more sluggish than a "D" valve or piston valve power plant, so you have to give it a little more throttle to start then be ready to cut back on the throttle to avoid a runaway. The longer the consist, the less of a problem this is. You'll get the hang of that. I regularly do operations and switching with mine. The 3:1 gear ratio alleviates some of this. I have heard that slightly throttling the exhaust of oscillating cylinder engines tames them down a bit, but I have not tried this. Maybe adding a PM Research globe valve in the exhaust line would be a good experiment.

This locomotive also consumes more water than I anticipated. This is why the Goodall valve is original equipment. Check water and possibly refill every 10 minutes or so, depending on operating conditions. You might go longer after break-in, but I take no chances. Those PM cylinders are hungry, and there's a 3:1 gear ratio they drive through, too. There's a lot more you can do with this locomotive once the initial build is completed. I have mentioned my own Heisler a number of times in the course of this project, and it can be seen on the cover of this issue.



Drawing 6-4



Westside Lumber Heisler Cab in place on the author's prototype. Note the addition of the "Wagon Top" Boiler Wrapper.

My West Side No.3 Heisler chassis and mechanism is identical to what has been described in these articles, but I have added and altered a few other things that may be of interest. First of all, the boiler wrapper is scratchbuilt and simulates a wagon top boiler as used on the West Side Heislers. This meant that I had to use the Roundhouse Type 2 boiler (the project loco uses Type 1) because of the location of the filler ports. I also had to add an additional port for the safety valve at the rear of the boiler, under the large steam dome.

The locomotive is radio controlled with servos for both direction and throttle. I find this useful in doing switching and operations. The headlight and backing light are both functional, with a backing light servo that activates when the locomotive is put in reverse.

A water sight glass, supplied by PM Research, was added along with a purge valve at the bottom of the sight glass to clear it when needed. To top it all off, I painted the cab roof red like the West Side Heislers. I know that the pilots were painted red, too, but I made wood pilots and like them in natural stain.

I hope you have enjoyed this series on the freelance Heisler as much as I have enjoyed bringing it to you. I will have my West Side Heisler at Diamondhead this year. If you see it running, stop over and say hi. I would like to see a time, maybe in a year or two, when we can run multiple lash-ups of freelance Heislers at Diamondhead!

Note: All of the bunker and cab cutting and detail drawings are available at www.steamup.com under the Workshop Plans menu. — editor.

The Author's completed Heisler looks right at home in his wooded garden railway.

Bob's Bit's

Weekend Projects for Steamers
by Bob Sorenson
CAD by Dan Pantages

Gas Control Valve

Today's project is a general purpose butane gas control valve. This valve is a brass and steel silver solder fabrication using common bar stock, taps and dies. Machine work is done on a small lathe using two shopmade fixtures to aid construction. Experimentation showed that the valve provides a fairly wide range of control on typical poker type burners.

Begin work with fabrication of the valve body (**Drawing 1**). The valve body consists of two pieces made from quarter-inch diameter brass rod. The body blank (**Drawing 2**) is 7/8th-inch long with 1/4-inch x 40 threaded on both ends for 1/4-inch. Drill one end of the body blank with #30 to a depth of 1/4-inch. Drill the other end with #57 as shown. These holes serve as pilot holes for final machine work later. Finish the body blank with #21 drill thru and on center. The output nipple blank **(Drawing 3)** is also from 1/4-inch diameter brass rod. One end is turned to 5/32-inch diameter for 9/32-inch and the other end 1/4-inch x 40 threaded for 1/4-inch. The #30 drill serves as a seat for a compression cone later. **Photo 1** shows the parts for the throttle body and **Photo 2** shows the throttle body weldment after silver soldering.

Final machine work on the valve body requires a fixture. The fixture is a length of 3/8-inch hex brass with 1/4-inch x 40 drill and tap. Clamp the fixture in the three-jaw chuck. Insert the valve body weldment in the fixture and secure with a 1/4-inch x 40 jam nut as shown in **Photo 3**. In this setup, drill #38 to a depth of 1/2-inch, followed by #5 x 40 tap and drill #57 thru. The final step on the valve body is to break thru the output nipple into the center of the valve body with #57 drill.

The jam nuts (**Drawing 4**) are from 5/16-inch diameter hex brass stock. Chuck the stock in the three-jaw lathe chuck. Drill and tap with 1/4-inch x 40 to enough depth to parts off two nuts.

The packing nuts (**Drawing 5**) serve as both a valve stem

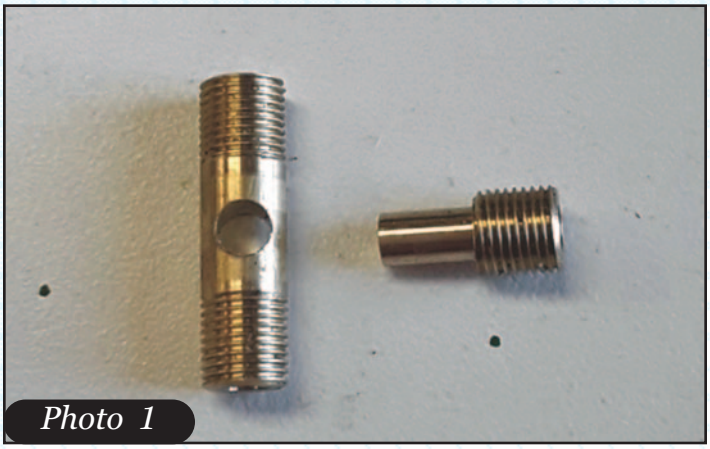


Photo 1

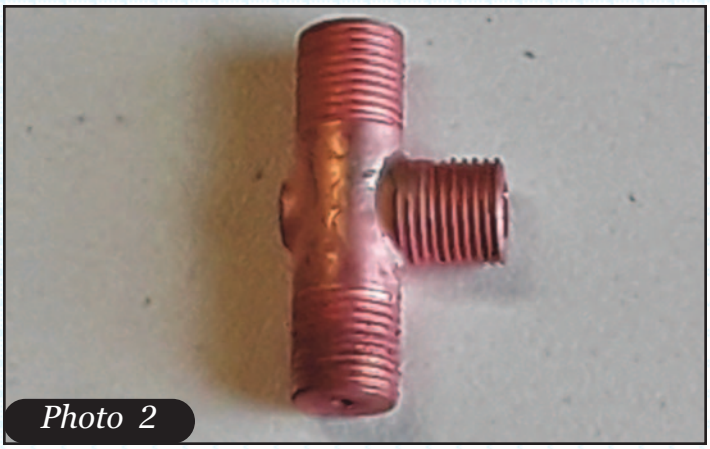


Photo 2

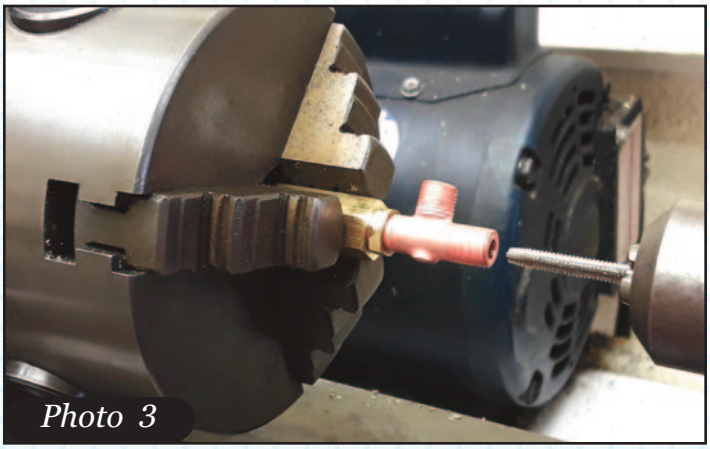


Photo 3

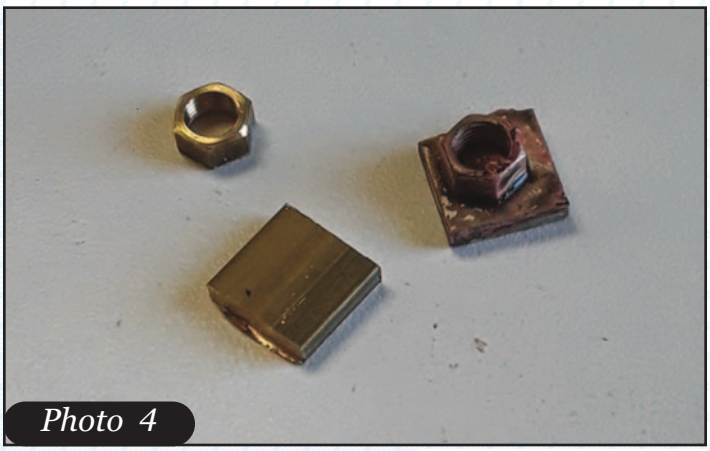


Photo 4

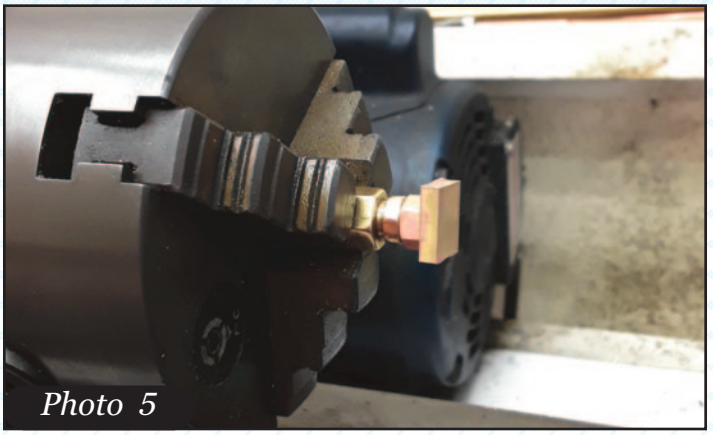


Photo 5

seal and compression fitting for the tube to the burner. The packing nuts are a brass and silver solder fabrication. The nut body is 5/16-inch diameter hex brass stock, drilled/tapped 1/4-inch x 40 and parted to 5/32-inch length. The nut flange is 1/8-inch x 1/2-inch brass bar. Silver solder the nut body to the flange stock as shown in Photo 4.

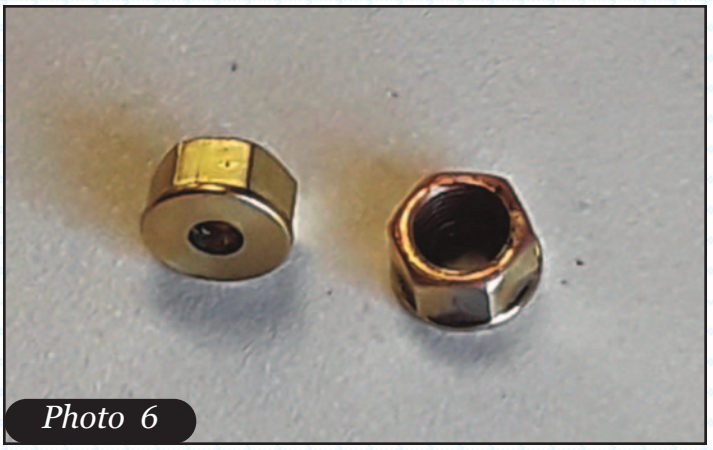


Photo 6

To finish the packing nuts make a 1/4-inch x 40 male fixture. Clamp the fixture in the three-jaw chuck and secure the nut blank as shown in **Photo 5**. Drill thru the nut flange with #30 drill. Turn the nut flange to 0.360-inch diameter and face to 1/32-inch thickness. **Photo 6** shows the finished packing nuts.

The valve stem (**Drawing 6**) is a steel silver solder fabrication with a commercially available brass knurled nut. **Photos 7 & 8** show the valve stem parts and final stem. The overall length of the stem can vary as needed, however maintain the #5 x 40 threaded end and tapered portion as shown.

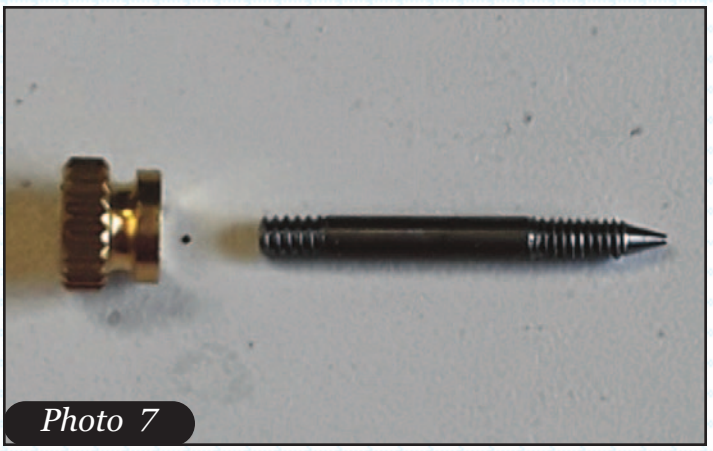


Photo 7

Fabrication is done. **Photo 9** shows all the parts ready to assemble. On the right side is a compression cone **(Drawing 7)** silver soldered to a 1/8-inch diameter tube, with a compression nut. This tube is the output to the burner. Also on the right side is a 4-inch long piece of plumber's teflon tape twisted into a tight string. This is the packing for the valve stem. Prior to final assembly, polish the packing nuts, jam nuts and valve stem knob to a very high shine. Either polish or paint the valve body as desired.

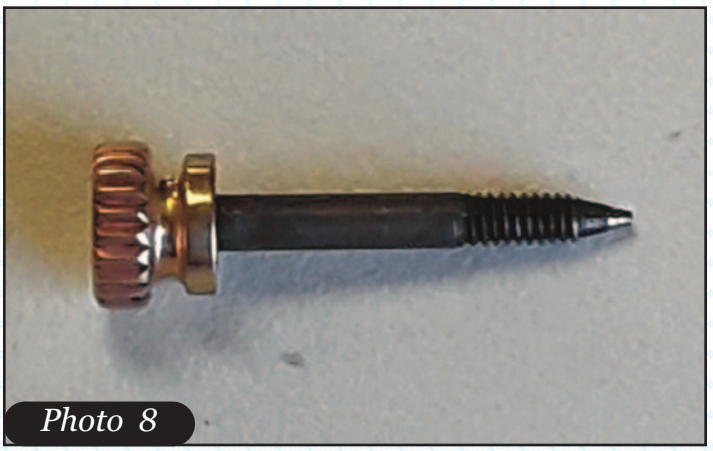
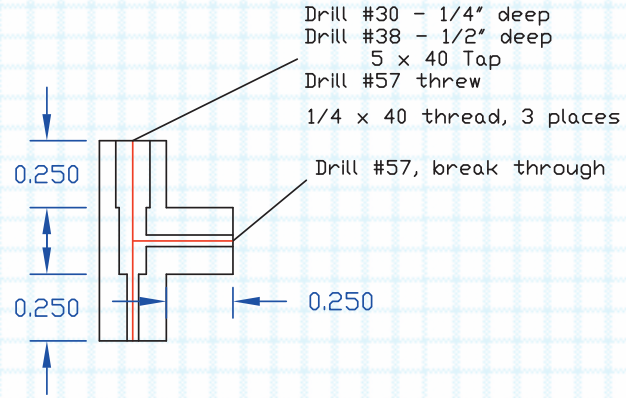


Photo 8

For final assembly, install the jam nuts on the top and bottom ends of the valve body. Screw the valve stem rather tightly by hand into the valve body. This will make a "seat" in the valve body for the stem. Place a packing nut over the valve stem. Wrap the teflon tape around the valve stem and pack it into the nut. Screw the valve stem back into the valve body along with the packing nut. Tighten the packing nut just enough to prevent leaks. Secure the packing nut with the jam nut to prevent loosening during use. **Photo 10** shows the complete valve ready to install.

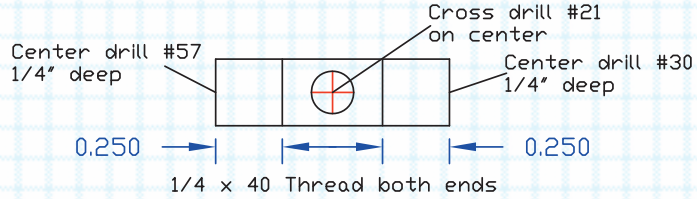
#1

Valve Body - Brass Fabrication



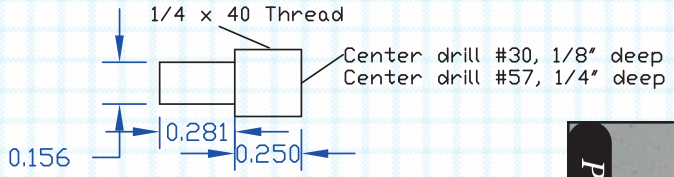
#2

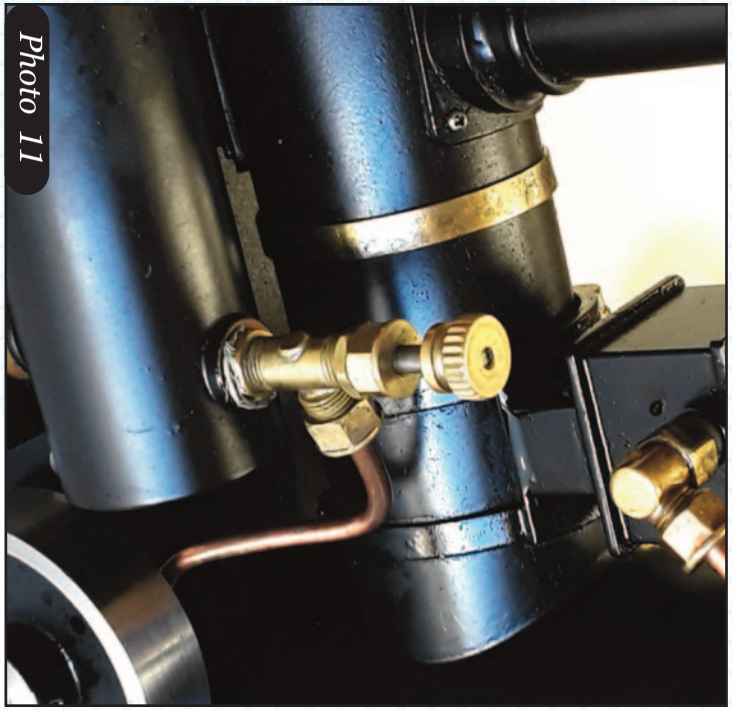
Body Blank - Brass Fabrication

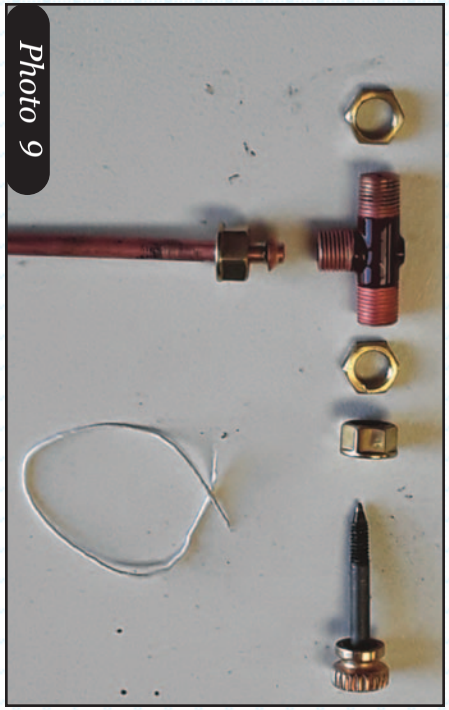


#3

Output Nipple Blank - Brass Fabrication







This valve design is versatile and can be altered to fit a number of jobs. **Photo 11** shows the valve as designed installed on top of the fuel tank. **Photo 12** shows the valve installed on the side of the fuel tank. There is an uptake tube inside the fuel tank that collects gas from the top of the tank. The valve body in this case is a three piece weldment. There was no room in the cab of the engine in **Photo 13,** so the gas valve ended up on the fender.

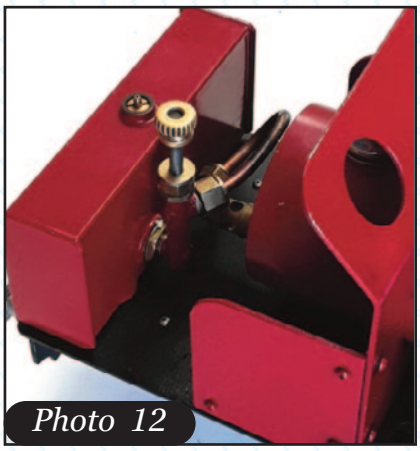
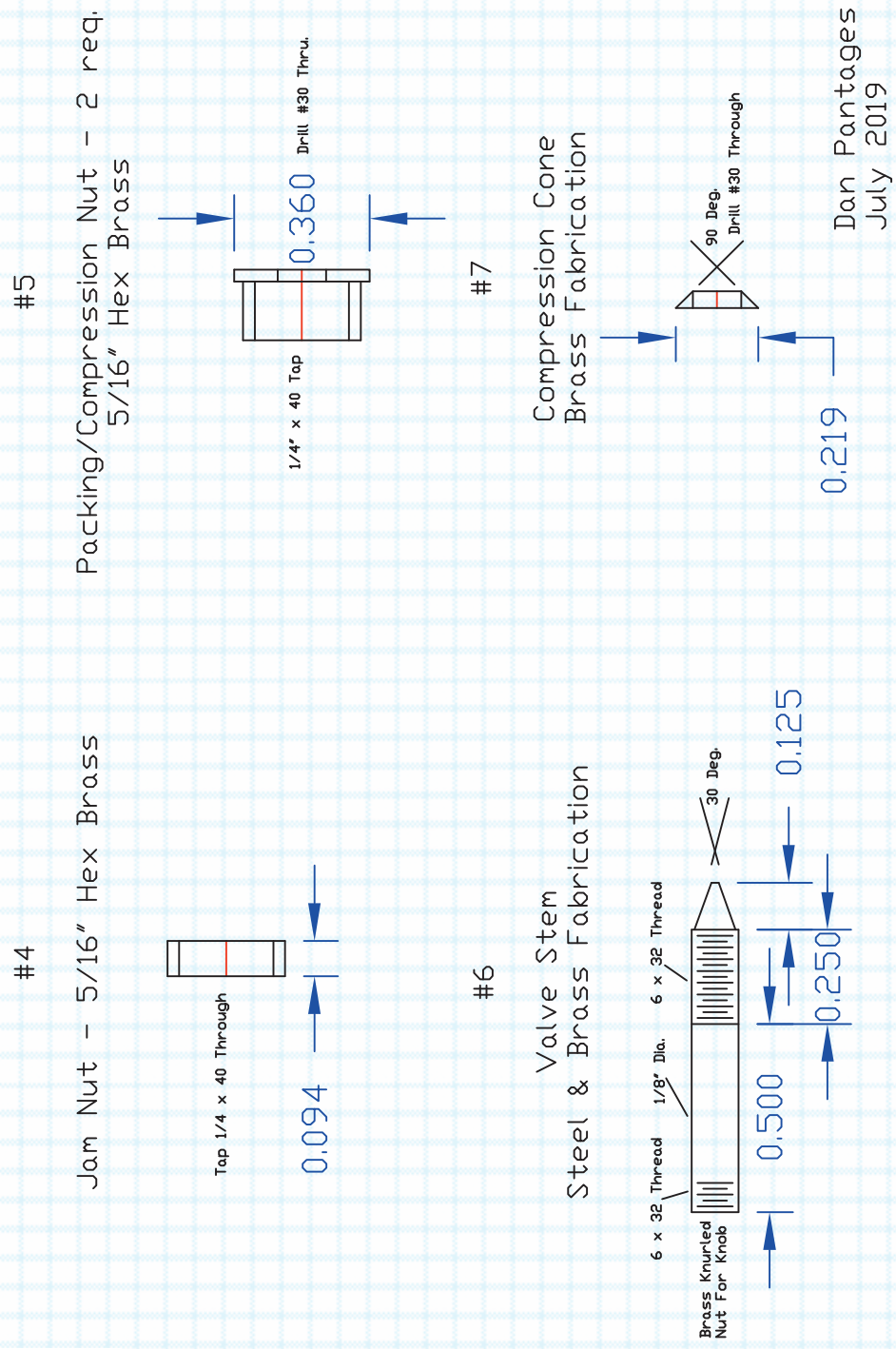


Photo 12

Photo 13



Wings Wheels & Whistles

Text by David Cairns
Photos by Brian Melmoth

Pietermaritzburg Model Engineering Society
Pietermaritzburg, South Africa

The first weekend in August heralds the holding of the annual *Wings Wheels and Whistles* hobbies exhibition at the Pietermaritzburg Model Engineering Society (PMES) premises, Rudling Road Pietermaritzburg. This show is believed to be now in its 16th year. On this occasion two other events coincided with *WWW*, a National Live Steam Meet and a garden railway exhibition. This article is devoted mainly to the latter.

The weather was kind, if a trifle hot on set up days. The park-like grounds and revamped station with its new paving made for an ideal setting in which to host the event.

In addition to the model engineering scales which drew locomotives from all over the country to run on the seven and one-quarter-inch, five-inch and three and one-half-inch tracks, 45mm, 32mm and Rodney Proud's Lionel/American Flyer/Trix Twin layouts were also featured.

A range of stationary steam engines was also on display including a number made from the excellent value horizontal, vertical and boiler kits that PMES sells.

A Marklin Prussian class T18 which later became class 78 pulling a rake of Marklin German State Railways (DRG) coaches. Note the busy station for the ride on trains at rear.

Other hobbies, including woodworking, radio controlled airplanes, philately and coin collecting, card and jewelry making were on display. Minerals were also exhibited as were leather working, sewing and miniature wagons.

Attendance was slightly up on last year at around 2200. Train rides on the two days totaled around 2500, also an improvement on last year. There were two portable large-scale layouts on show; Umkhulu Modules, a dual 45mm and 32mm layout

Roundhouse 'Lady Anne' strutting her stuff. This loco and the rake of coaches was built in 2000 by the late Don Baker, a strong supporter of PMES in the early days.

which has been a regular visitor for the past five or six years, and Carel Janse van Rensburg's twin track 45mm layout which came all the way from Centurion.

Set up of both layouts commenced on Thursday. Being smaller and with tracks permanently fixed to the baseboards, the Umkhulu Modules layout was pretty much erected by the end of the day while the boards on Carel's layout were up, thanks to some hard work from Carel and his son Christiaan. On Friday the laying of track was completed.

The lead-in photo of Carel's track shows the use of metal legs for the CCA-treated slatted decking wood. The baseboards are joined with 6mm threaded rods and wing nuts and the track is then nailed down.

Umkhulu Modules uses adjustable wooden legs to support the shutterboard baseboards which are joined by 13mm carriage bolts and wing nuts. The

Marklin type B VI of the Royal Bavarian Railways (K.Bay.Sts.B.)

If you are 'in'to' SAR narrow gauge you have to love this loco – an Accucraft UK 16mm live steam NG15. This loco is designed for 32mm track but is re-gaugeable to 45mm. Only 50 were made but another batch is planned. Start saving for yours now!

tracks are then joined with fishplates, and banana plugs ensure continuity on the electrified 45mm track.

An event similar to *WWW* was held on the 21st and 22nd September at the Model Engineering grounds, Centurion. Insofar as large-scale modellers are concerned, the main item of interest was the opening of the Gauge One track recently constructed at the club at the initiative of Carel Janse van Rensburg. Initially only 45mm gauge equipment will be able to be run. Umkhulu Modules, which also has a 32mm track, will also be attending from Durban, so this will enable live steam and battery controlled locos in that gauge to be run as well.

Danger! Man at work. Author David Cairns fuels his Roundhouse R/C tram based on Billy chassis for a run at WWW.

Fall Steamup in Sharpsburg, Maryland

Host Ron Vertrees prepares his Aster GWR "Kingswear Castle" for a run on his railway.

Scott McDonald Photo

Mike Moore's Accuraft 16xx GWR passes a visiting red "Cricket' as it rounds the corner with a full head of steam.

Scott McDonald Photo

An O Gauge "James Spooner" sits at the station on the separate O Gauge Garden Railway line, ready to head out for a days' run.

Scott McDonald Photo

Ron sends his GWR Castle off into the garden with a long rake of coaches.

Scott McDonald Photo

THE CUPOLA VIEW

Education in Locomotive Terminology

What an education this issue has been for me in proper locomotive terminology. The fun part of editing is trying to tie together, in some cases, the terminology from different continents into a cohesive story line that everyone will understand no matter where you are in the world. Attend a steamup anywhere in the U.S. and you will find locomotive models that represent the technology from a variety of countries. Some of these countries may have their own unique terms to identify a part of the locomotive. This makes editing all the more fun, and sometimes confusing to your ever aging editor, as we try to ensure that our readership will understand what the author is trying to convey.

Sometimes it is just a matter of spelling. For example, the term "back head". Is it two words? Is it one word (e.g. backhead)? Or is it supposed to be hyphenated (e.g. back-head)? When first presented with Derek Pollard's and Chris Tolhurst's wonderful creations of their detailed back heads. I opted for two words. Why you may ask? (And many did.) Here at *Steam in the Garden* we have a style guide that was developed by our late editor Dave Cole to ensure we maintained consistency in editing. We occasionally update or change it to go with modern convention, but strive to preserve the legacy of railroading. It turns out that according to the Locomotive Cyclopedia of American Practice printed in 1922 the term for the part of the boiler that is in the cab where the engineer and fireman operate the locomotive is two words – back head. A quick search through the internet and you will find the term in the three various states that I mentioned at the beginning of this paragraph. I can only presume that this early document was the basis for our style guide of how we approach this term. However, many more modern documents and current glossaries for railroad terminology will condense it into one word – backhead. (Which when typing in my word processing software gives me a red squiggly line. So maybe the software knows about the 1922 document?)

So I ask our readers and authors to bear with us as we try to bridge the gap between continents and railroad terminology from across the seas. Our hobby is truly international, and many of us are divided by a common language. (With apologies to either Oscar Wilde, George Bernard Shaw or Winston Churchill – depending on who you accept as the author of that statement!)

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.

TIMETABLE

Special or Annual Meets

Cabin Fever Model Engineering Show January 17-19, 2020 - Lebanon Valley Expo Center & Fairgrounds, Lebanon, PA. Gauge One Tracks available for steaming. Visit *www.cabinfeverexpo.com* for more information.

International Small Scale Steam Steamup. January 20-26, 2020. 103 Live Oak Drive, Diamondhead, Mississippi. Visit *www.diamondhead.org* for more information.

Staver Locomotive Spring Steamup - April 23-26, 2020. Staver Locomotive, Portland, Oregon. Visit *www.staverlocomotive.com* for latest information.

National Summer Steamup 2020 - July 8-12, 2020. McClellan Conference Center, McClellan, California. Visit *www.steam-events.org* for more information.

Fourth Annual Gathering of North American Members of the Association of 16mm Narrow Gauge Modellers - September 18-20, 2020. Hazlet, NJ. Visit *www.northamerican16mmmodellers.org* for more information.

Regular steamups

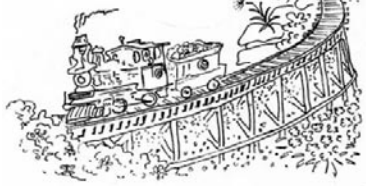
Crescent City High Iron. Steamups as necessary on an elevated backyard layout on Northern California's upper coast. Info: Don Cure, diamondd1947@msn.com.

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*.

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.

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

Jeff Campbell - Jeff Campbell was infected with the train bug at an extremely early age. Thanks to his father, Jeff's first bedroom held a crib, dresser, and a 4X8-foot HO layout. Years later, at the local fair with his family, Jeff noticed a G scale layout in the garden exhibits and a fuse was lit. Under the guise of getting his young son a "Toy Train" for Christmas, Jeff's empire was launched. Jeff's interest in live steam began while riding on the tender of a 2-4-0 at Disneyland. All the valves, pipes, and gauges were so intriguing and within weeks a kit form Accucraft Ruby was running in the back yard, which turned him into an avid live steamer.

Les Knoll - Les started his railroading experience with a Lionel F7 freight set at Christmas at age 6. This grew to a tabletop layout in the family basement, later to be supplanted by a theater pipe organ and a rock band practice space in his teens. Later in life the HO/HOn3 bug bit, and the first incarnations of his Rivendell & Midland Railroad, one of the first JRR Tolkien-based railroads in the US, took shape. The R & M moved outdoors with his discovery of live steam in the early 90's, and after two purchased locomotives, five scratchbuilt live steamers followed, ranging from a 14-ton Shay to a 2-4-4-2 logging Mallet. The current Rivendell & Midland is in the back yard of Les's and wife Ruth's lake home in North Carolina. Les is a retired Forensic Engineer and a Registered Professional Mechanical Engineer.

Derek Pollard - Derek Pollard is a retired communications engineer with a lifelong passion for model railways, with many articles published in a range of journals. In his spare time he regularly drives full size trains on a heritage railway. He has been working with Chris Tolhurst for many years, both in prototype research and production support.

Chris Tolhurst - Chris Tolhurst is a retired engineer living in Suffolk, England. For many years he ran TME, a manufacturing company specialising in small batches of detailed live steam miniatures. He has produced models in all scales from 1/32 Gauge One up to 1/4 scale traction engines. Most commercial production runs by TME have been in 16mm/ft but Chris's hobby is 1/32 Gauge One and in retirement this will be the principle focus of future builds.

Bob Winkel - Bob Winkel, of Rochester, Michigan, bought his first live steam locomotive, a 7.5-inch gauge Conner beam engine, in 1997 and still runs it at the Great Lakes Live Steamers track. He was introduced to G-scale steam by Bill Kay and joined the Michigan Small Scale Live Steamers in 2007. Bob's related hobby activities include a small garden railroad and making scale loads for his flat cars. He has written over a dozen articles about live steam activities that have appeared in Model-tec, Live Steam and Steam in the Garden.

***Your Name Can be on this Page!* -** The whole world is waiting to hear from you! We are always looking for Live Steamers to share their thoughts, experiences, projects, latest acquisition... The list goes on!

We need Locomotive Reviews, Tips & Hints, Steamup Reports, etc. All contributors are compensated for their submissions. Submitting is easy. Just e-mail your idea to sitgeditor@gmail.com and we'll work with you to bring your article to our pages. Visit www.steamup.com to view our Contributor Guidelines to see how easy it is to show the world your small scale live steam interests!

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March/April 2019

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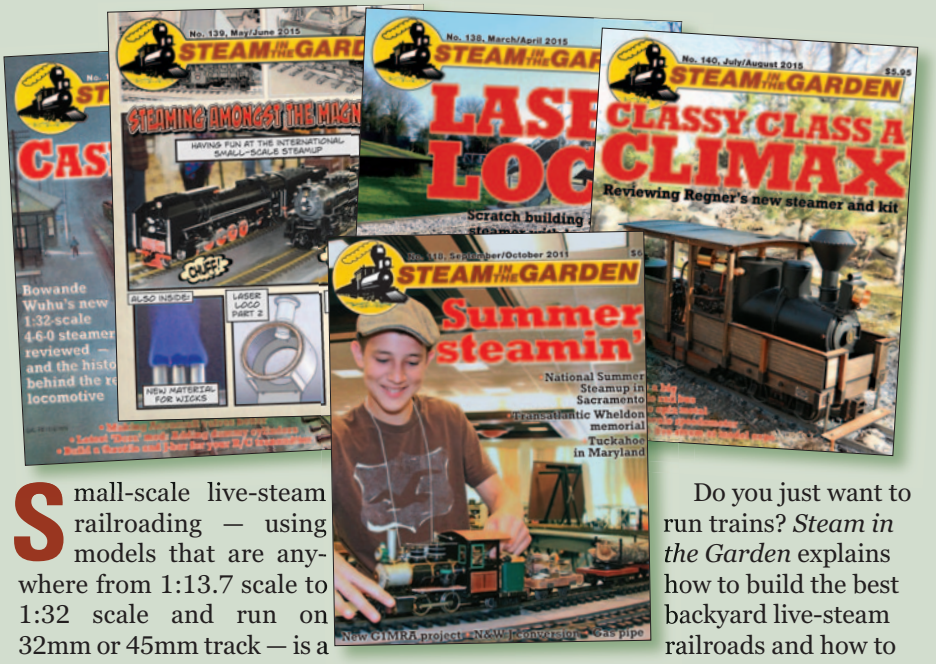

Small-scale live-steam railroading — using models that are anywhere from 1:13.7 scale to 1:32 scale and run on 32mm or 45mm track — is a fun hobby that has room for rivet counters and freelancers, prototype purists and lovers of whimsy.

Steam in the Garden is the only magazine devoted entirely to covering the small-scale live-steam hobby. Since 1990 the magazine has taken readers inside the railroads and inside the workshops of the leading modelers and shown how fun and easy live steam model railroading can be. Six times a year, *Steam in the Garden* gives subscribers a look at the current trends in the hobby and reviews the latest products available.

Are you a builder of live-steam models (or do you want to be)? *Steam in the Garden* has detailed articles that explain how experienced builders create those once-in-a-lifetime projects that can't be found anywhere else.

Do you just want to run trains? *Steam in the Garden* explains how to build the best backyard live-steam railroads and how to build portable layouts as well.

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Want to know what's happening at the leading live-steam events? *Steam in the Garden* will take you there, to give you a flavor of what's happening, both on the track and in the clinic rooms, as well as the latest products shown by exhibitors.

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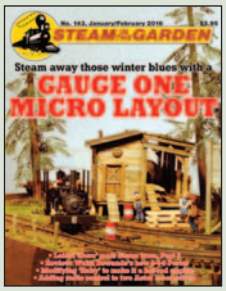

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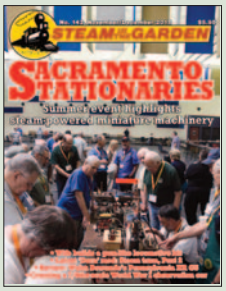

Vol. 25, No. 6; Issue 142; Nov/Dec 2015
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