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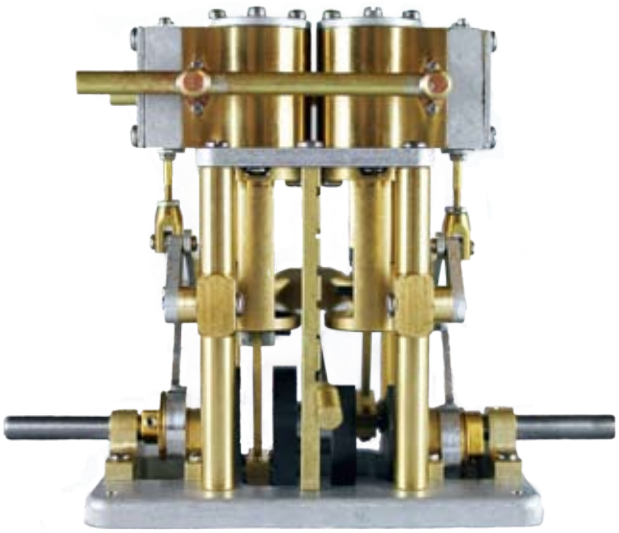

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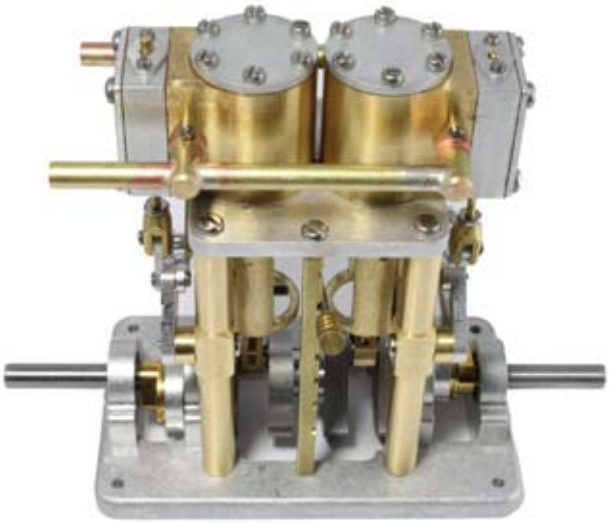

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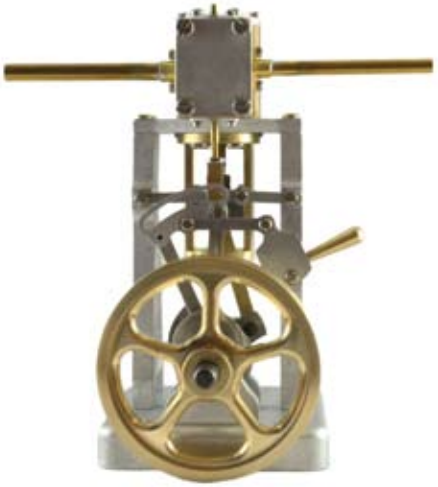

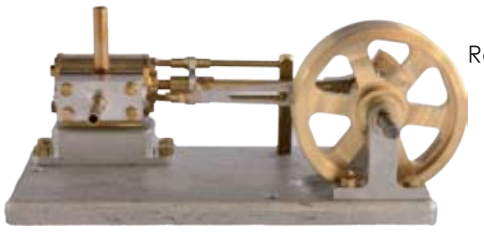

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STEAM IN THE GARDEN

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Cover: Jim Hadden of Midway, Utah, preps his 'Elsinor' hops train at 2016's National Summer Steamup. Photo by Rick Parker.

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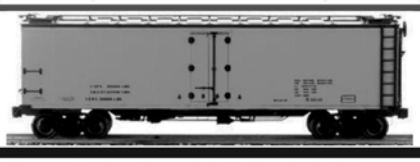

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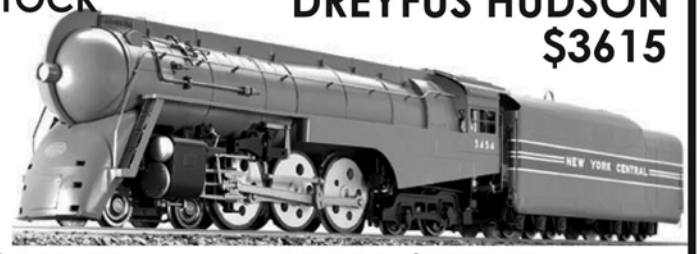

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LATEST WAYBILL

Aster, Accucraft announce alliance

Yokohama, Japan-based Aster Hobbies Inc. said in September it had entered into a collaboration with Accucraft Trains of Union City, Calif., to have Accucraft manufacture small-scale live steam locomotives at its factory in China on behalf of the Japanese company.

The alternative, said Susumu Fujii — the owner of Aster — was to shutter the business and exit the hobby.

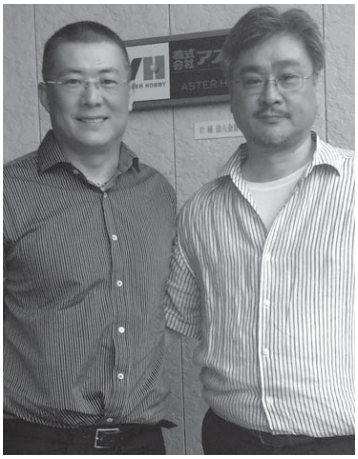
Accucraft did not respond to repeated requests for comment.

In a post to an online forum, Fujii-san wrote, "I had a feeling of desperation." He cited the exit of the United Kingdom from the European Union, the U.S. presidential election and "repeated worldwide financial crises and terrorism, and Great East Japan Earthquake [of] 2011."

Fujii-san said he had approached Accucraft's owner, Bing Cheng, and proposed they "collaborate on future projects." Upon striking the deal, Aster will stop making models in Japan and the company "will move to a smaller factory."

Aster will continue to provide service and support to its customers, Fujii-san said, as well as sell repair parts to customers.

The alliance was first mentioned in early September by Andrew Pullen, the owner of Aster Hobbies UK, who in a post on his web site said that the first project to be co-developed by Aster and Accucraft would be the British Rail 9F, a 2-10-0 that was built from 1954-1960. The last of the 9Fs was given a name, the "Evening Star."



Collaborators: *Bing Cheng of Accucraft, left, and Susumu Fujii of Aster, right, at Aster's Yokohama, Japan, factory. Photo courtesy of Fujii-san.*

The 9F was chosen, apparently, because Pullen and his collaborators in the United Kingdom had developed a sophisticated set of scale mechanical drawings of the locomotive.

In his post a week later, Fujii-san said that as a "comparative review," both Aster and Accucraft will assemble separate 9Fs based on parts they have each made. Pullen and others in the United Kingdom will then "compare the performance between pilot model with Aster-made parts and pilot model with Accucraft-made parts."

Fujii-san wrote, "If we cannot get [Pullen & Co.'s] approval, we will not release."

According to the "Aster Manual & Catalog" (distributed in the 1970s-1990s), the company started in 1955 as a maker of mechanical cash registers. When cash registers went electronic, a company engineer suggested making Gauge One live steam locomotives.

In 1975, Aster released its first two engines, the British Southern Railway "Schools Class" and the Japanese National Railroad Mogul 8550. The company built 3000 kits of each, it said. These were roughly to scale.

A few years later the company moved into fine-scale Gauge One with its Paris-Lyon-Mediterranee (PLM) 231 Pacific, and over the next decade the company continued to manufacture more and more complex locomotives — including complex and compound engines.

Aster's successes in small-scale live steam didn't go unnoticed by other model train makers and in 1988, LGB Trains commissioned Aster to build the "Frank S," in the German toy maker's 1:22.5 scale. Aster has traditionally made both kits and ready-to-run locomotives. In addition, on its web site it says it also makes "bagging machines for laundries."

Accucraft is on the Web at http://www.accucraft.com or by phone at (510) 324-3399, while Aster's web site is http://www.asterhobby.com/ or by phone at +81 45 934-5646.

'Casey' consist: *Stoke 'M and Smoke 'M has commissioned rolling stock kits for Wuhu Bowande's 'Casey Jones' locomotive; here is the coach. Photo by Scott E. McDonald.*

New rolling stock for 'Casey Jones'

Period-appropriate rolling stock for the "Casey Jones" locomotive from Wuhu Brand Arts & Crafts Co. Ltd., is being developed by Wuhu Bowande's U.S. representative, Stoke 'M and Smoke 'M of Mount Airy, Md., the company said at model train events in July.

First in line will be a 1898-era truss rod wooden coach, Bob Clark — owner of Stoke 'M and Smoke 'M — said. "The car has been designed for the 'Casey Jones' train and comes complete with Kadee couplers, trucks with Gary Raymond wheels, Illinois Central decals and detail parts," he said "The upper

windows come 'already frosted.'"

The "Casey Jones" is Wuhu Bowande's 1:32-scale live-steam model of the Illinois Railroad's 4-6-0 "ten wheeler," No. 382, built by Rogers Locomotive Works in 1898. The locomotive became part of railroading lore when engineer John "Casey" Jones stayed in the cab during an accident, leaning on the brakes, and dying to save the passengers of his train. Jones' heroics were memorialized in song, making the legend.

The new wooden coach will be built to order, Clark said, and will come either as completely built with a full interior, built but with an interior kit for the steamer to complete, or as a full kit made with tab-and-slot construction. The interior has laser-cut armrests in the seats, Clark added.

A railway post office car is set to follow the wooden coach, Clark said.

For more information contact Stoke 'M and Smoke 'M on the Web at http://www.livesteamg1us.com or by calling (301) 467-3349.

In memoriam: Fred Devine

A longtime sales executive in the model-train industry who pioneered the use of 1:29-scale in live steam died last spring. Frederick C. Devine, who was affiliated with Accucraft Trains, succumbed to the effects of chronic obstructive pulmonary disease on May 9, 2017, 80 years to the day from his birth, at his home in North Las Vegas, Nev.

After a long career with the former Minolta Camera Co. Ltd., Devine took early retirement at the beginning of the 1980s after being the company's U.S. national sales manager. Shortly thereafter, Devine — a fanatic about model trains — became affiliated with Aristo-Craft, a division of Polk's Model Craft Hobbies Inc. (both firms closed in 2013), a maker of large-scale electric trains.

When asked why Aristo had chosen 1:29-scale — rather than the accurate scales of 1:32 (where 45mm track represented four-feet, 8½-inches) or 1:22-scale (45mm equaled three-meter prototypes) or 1:20.3-scale (for three-foot-gauge real trains) — Cliff Luscher of Accucraft said Devine often cited, "The 'wow' factor."

Throughout his model-train career, Devine represented a number of manufacturers (the longest with Aristo), including USA Trains and for the last 17 years, Accucraft Trains. His business, Devine & Associates Inc., was a sales firm not only for locomotives and rolling stock but other model railroad accessories as well, said Robby Dascotte, a friend and proprietor of RLD Hobbies of Albion, Ill.

Devine persuaded Accucraft to move into 1:29-scale and the company's American Main Line (AML) brand of products is the direct result of Devine's influence. He continued to work up until the last, attending Pennsylvania's York Train Meet in October 2015.

Devine was born in Rockford, Ill., in 1937, and was raised the adopted son of a minister of the First Covenant Church, according to Stan Cederleaf, the Arizona live steamer and train-decal maker. Stan and Devine went to high school together at East Rockford High School (Devine a year ahead), but they lost touch over the years. They reconnected at

the now-defunct Queen Mary Show in Long Beach in 2002-2003.

After high school, Devine attended theological seminary. He is survived by (at least) six ex-wives and four daughters. There was no funeral but the family did gather for a private service in Las Vegas in May.

New Accucraft in 1:19, 1:13.7 scales

In recent weeks Accucraft Trains and its dealers have announced two new small-scale live steam locomotives: a 0-4-4-0 Garratt based on an original that ran in Tasmania and a Forney that runs in Maine.

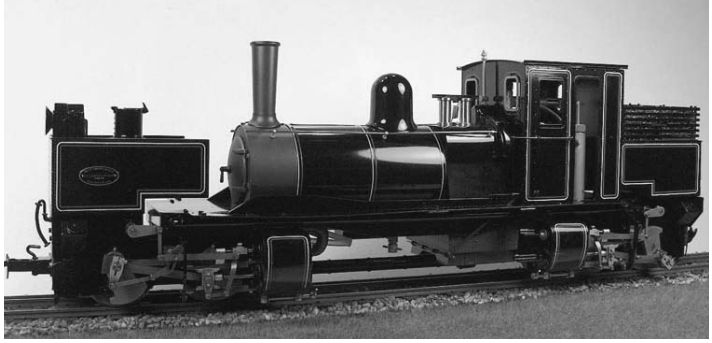
The prototype Garratt first ran on two-foot rails on the island off of Australia from 1910-1930. K1 and its sibling K2 were in storage for 17 years and in the late 1940s the boiler from K2 was put into K1 and at the same time was shipped to England. The locomotive was on display for many years and ultimately was acquired by the Ffestiniog Railway in Wales. It became the centerpiece of a restored Welsh Highland Railway Ltd., where it ran in regular service starting in 2006. It is currently undergoing a "heavy general" overhaul.

The model, developed through Accucraft UK, will be available gauged either at 32mm (for accurate scale) or 45mm. It will be butane fired, with twin flues in the copper boiler, operating at 60psi. The gearing will be simplified Walschaert with slide valves, and the engine will have traditional cab controls (though the oiler will have an under-floor drain valve). The locomotive will be 22⅞-inches long (580mm), 5⅛-inches wide (130mm) and seven-inches tall (180mm).

The K1 Garratt will come in multiple versions, either with or without coal rails and in liveries including lined gray, lined black and an unlined black.

Sandy River & Rangeley Lakes No. 6, an 0-4-4 Forney in 1:13.7 scale, is based on the prototype that runs in regular service on the Wiscasset, Waterville & Farmington Railway in Alna, Maine, as its No. 9. The locomotive was originally built in 1891 as No. 5

Forney: *Live-steam model of an 0-4-4, built in 1891 but still running at a railroad museum in Maine.*



Tasmanian devil: *Model of two-foot Garratt originally used in Australia and is now in Wales.*

on the Sandy River Railroad by The Portland Co. It went through a number of owners and was in storage from 1937-1994, when the WW&FR, a museum dedicated to two-foot rail in Maine, acquired and restored it.

Accucraft's SR&RL model, a butane-fired engine with a ceramic burner, will be 22⅛-inches long (562mm), 6⅛-inches wide (155mm) and 8¾-inches tall (221mm), and will be gauged at 45mm. The engine's boiler will operate at 60psi, have two cylinders, feature full working Stephenson valve gear, a hand pump, water sight glass and include such regular attributes as a copper boiler, pressure gauge, safety valve, forward/reverse Johnson bar and a lubricator.

No price has been set for the K1 Garratt, while Accucraft said the price of the Forney is $3200.

In the S.F. Bay Area this summer, it was all about the icon

Steam at the 32nd National Garden Railway convention

Text by Gary Woolard. Photos by Carla Brand Breitner.

For aficionados of small-scale live steam, the annual meeting of garden railroaders usually has only meager reasons to be interested. Not this year: at the 32nd National Garden Railway Convention, hosted by the Bay Area Garden Railway Society last July 4-10 in Santa Clara, Calif., more than 22 percent of the open backyard layouts were live-steam oriented, many of the clinics offered were given by live steamers and the centerpiece of the supplier exhibit hall was BAGRS' own live-steam oval, with water boiling every time the venue was open.

By just about any measure, the convention was a great success (organizers said 1200 attended the full convention and 1000 of the general public came to the exhibit hall on Saturday). About 90 layouts in Central & Northern California had open houses over the course of the convention, in addition to several days of "pre" and "post" convention tours.

The convention guide book (at 96 pages long, I hesitate to call it a "booklet") was a triumph of modern design. Like a smart phone on paper, it was full of easily identifiable and significant icons, denoting everything from water features to trestles and bridges to restrooms. You honestly didn't have to read anything to get a synopsis of any layout's features — just glance across the chart of icons.

Icon, book: *Top, the steam-layout icon, bottom, the event book. All convention branding and graphics by Jenifer Ingerman Miller; used with permission.*

But for steamers, the most important icon was the simple gray picture of a smoke stack with steam rising from it, that said "this layout runs live steam." Of the 90 layouts "on tour," 20 carried this icon.

To be fair, not all of the layouts that might normally be running steam did so during the convention. Without extra help, and with the prospect of busloads of people coming through the layout and demanding attention, several operators chose the option of running a sparky or two (usually battery-powered) around the layout while they played polite host and answered questions.

But those layout operators who requested some assistance in demonstrating the delights of live steam to folks largely unfamiliar with it, received it through the coordinating efforts of Richard Murray, head of the BAGRS Live Steam special interest group, and his team. They made sure that there were experienced steamers on hand to keep the engines running, while allowing the layout owners to play host to their guests. Richard understood that there are few things as unimpressive as a bare track with nothing run-

Exhibiting steam: *The BAGRS steam layout in the trade-show hall, with Glen Simpson and David Lindholm standing and Harlan Barr sitting. Bob Clark is in the blue shirt and ball cap standing outside the layout.*

Young steamer: *Jack Slovarcek, the next generation of BAGRS members, waters his Accucraft 0-4-4 Forney. Photo by Scott E. McDonald.*

ning on it — in fact he saw this support as being one of the primary tasks of the Live Steam group throughout the convention.

This was more difficult than you might think, because of a simple geographical accident — three of the most impressive steam layouts are all on the San Francisco Peninsula — which meant that they were open on the same day.

But the primary and crucial job of the special interest group was setting up and maintaining BAGRS' portable live steam layout, which anchored the back half of the exhibitors' hall.

This is a fairly new layout which BAGRS built about four years ago to replace its old one, which had deteriorated from much usage. It measures 55-feet by 24-feet — so it can handle the largest and most curve-gobbling of engines. The surface is made from panels of Dibond, a sandwich of aluminum and polyethylene which combines strength and rigidity with low weight. It is framed with a border of aluminum, which also provides extra rigidity, and the steel legs are individually adjustable. The table parts were cut, assembled and riveted together completely by BAGRS volunteers, and they are justifiably proud of it. Glen Simpson, vice president of BAGRS, brought the layout to the exhibit hall and got it set up, and for his troubles was "volunteered" to be track manager.

Richard hadn't been sure that they would get enough volunteers to keep the track manned throughout the convention, but the final sign-up sheet had 35 names on it. "Once things got rolling," Richard quipped, "people would volunteer just to get themselves a free orange T-shirt." (This is an exaggeration — I saw plenty of "walk-on" steamers at the track who weren't wearing the orange "convention staff" T-shirts.)

The layout was clearly a great success — there always seemed to be an engine or two running, as well as "civilians" around the oval taking cell-phone pictures and asking the inevitable, "how does it run, really?" questions. As always, the younger kids with wide eyes, who would tirelessly follow the engines around, were the most fun to observe.

Appropriately, many of the booths of live-steam interest surrounded the layout. Silver State Trains of Las Vegas, Nev., was right across the way and Bob Clark of Stoke 'M & Smoke 'M of Mount Airy, Md., was a few tables down the aisle. Clark occasionally used the track to demonstrate his engines from Wuhu Brand Arts & Crafts Co. Ltd., and new rolling stock offerings. Accucraft Trains was a very short walk away, and a booth for this very magazine was right on the corner. It was especially cool when Glen brought his version of the tinplate "Dora" — based on the tram from Marc Horovitz' instructions in these pages (see *Steam in the Garden*, September-

Demon builders: *Henner Meinhold and Bill Allen in the East Devil Hills Modeling Group's booth with Bill's scratch engines.*

Steam beer: *Henner's Guinness factory tram with its gantry to switch from narrow to standard gauge.*

Tinplate 'Dora': *Glen Simpson's modified 0-4-0 on the exhibit table showing off this very magazine.*

October 2015-January-February 2016, Nos. 141-143) to our booth. I got him to leave it on our table for the afternoon, and we placed it directly in front of the appropriate back issues.

Across the way from the layout was the third tent pole of the BAGRS steam group support effort — a booth with the puzzling name, EDH Lumber.

Is it because the BAGRS' Saturday gathering calls itself the "East Devil Hills Modeling Group" (self-described as "scratch builders, kitbashers and out-of-the-box thinkers")? Or is it because this informal work group was begun in 2002 by founding members Eric Maschwitz, David Wegmuller and Henner Meinhold (also "EDH")?

This booth was filled with exquisite examples of model engineering, most if not all of it steam-driven. Henner's Guinness brewery steam tram has become a full diorama, including hydraulic lift and passenger cars for brewery tourists. Of course there were several of the engines which we've seen Bill Allen build in these pages. There were steam tractors, threshers, dioramas and steamers of all scales; even a "logging show" which included two live-steam donkeys and two completely rigged logging spars, able to load, lift and drag logs across the table.

So backyard layout support, the BAGRS live-steam oval and the EDH modeling booth were the three linchpins of the steam special interest group's convention support. But there were a couple more areas of interest to the live steam convention-goer.

An "ice cream social" has become a traditional part of national garden railway conventions. Sometimes this means an ice cream hand-cart in the hallway while waiting for the exhibitors' room to open. Sometimes they're held at a local point of interest, like a train station or a museum. This year the tradition was fulfilled by two food trucks — one with gourmet ice cream cones and another with mini-burgers — set up in the parking lot outside the offices of Accucraft Trains, in nearby Union City.

The food was good, but unfortunately the ice cream truck wound up short-handed. This resulted in a long line, and some people complained or even left. I couldn't help thinking that those folks were sort of missing the point!

I took one look at that line and immediately turned left, through the doors of Accucraft's headquarters.

There the company has display cases along all the main walls, filled with one each of everything Accucraft has ever made, steam or electric, in every trim

Museum: *Accucraft's offices in Union City, Calif., have on display every one of the locomotives it's made.*

Ice cream and trains: *Conventioneers got treats and a sale.*

For sale: *Accucraft offered deals on many products.*

and livery. More importantly, there was a sale going on!

Tables and shelves were crowded with yellow-tagged engines and rolling stock which had sustained some sort of minor damage. Some had cosmetic scratches here or there, or a bent pilot, or were missing couplers. If you didn't like the yellow-tag price, haggle! One fellow I know walked away with what appeared to be the hand-made brass pilot model for Accucraft's original two-cylinder Shay. (He ran it later on the BAGRS table with great success.)

And if you couldn't find what you wanted or needed there, then you were invited to take 15 percent off of anything in the warehouse — which was, thankfully, very well organized, so you could quickly find what you were after. All the Accucraft staff, from owner Bing Cheng to General Manager Cliff Luscher on down, were trying to find books of sales slips so they could serve the small tidal wave of customers that soon began to flood the aisles.

So I walked out of there with a couple of AMS boxes tucked under my arm, walked over to the trucks and got a burger and an ice cream — no wait, no strain, no pain. It's all in the timing, people!

Every convention has its clinics, and this year's were organized by "coal conversion" author Rob Lenicheck — so it's no surprise that the convention was rich in clinics focused on the live-steam experience. Let's begin, appropriately, with a clinic called "Beginning in live steam" by Scott McDonald. If the presenter's name sounds familiar to you, it may be because you've bought the book "Starting in Steam" — and if you haven't, you should (just flip through these pages and find the ad that will tell you how to order it). While Scott tries to focus on the basics, more than one veteran steamer told me later that they learned something new from the clinic.

If you felt like you had butane-fired steamers down pat, then Steve Shyvers' "Live-steam firing methods" was the clinic for you. Steve covered all of the elements, from boiler design to operational differences, that make both alcohol- and coal-firing

locomotives unique experiences, each with its own challenges.

Some of us like burned fingers, some don't. For those of us who prefer being able to control our engines without having to chase them down the track, Steve Heselton offered "Radio control installation for live steamers." Steve made the dark art of stuffing batteries into tenders and servos into cabs much more accessible.

Heselton dispelled the notion that there was one absolutely correct way to install R/C, but he explained how he did it, illustrating each step of the process with slides, as well as having the engines themselves available for inspection. I left his class feeling much less intimidated by the prospect of R/C'ing my own engines.

Remote control is pretty much a prerequisite when you're talking about Jack Verducci's "Operating a railroad in the garden." The précis of the clinic claimed that its lessons "can be applied to track power and battery-powered railroads as well" (as live steam) and that's true enough — Jack uses a car-card system similar to many indoor HO modelers, and he explained it well during the clinic. But his original title for the clinic was "Railroad operations for live steam," and live steam occupied a large part of his presentation.

Verducci: *Two of Jack's grandchildren run trains on his layout.*

Crystal Springs operations: *Kermit Paul was the dispatcher.*

Jack's first experiments with live-steam ops were, in his own words, "pretty much a nightmare." His layout has grades, and his engines would stall going uphill, or run away going downhill. And of course, they would often run out of fuel, usually on the mainline.

The first thing Jack did to increase the reliability of his engines was to establish a "locomotive servicing schedule." Water to be added every 10 minutes, fuel topped off every 40 minutes. Every hour grunge drained and replaced with fresh steam oil, and every two hours running gear is inspected and very lightly lubed. Jack noted that this schedule is a "guideline," and some engines may require more or less service. Following it is the primary responsibility of each train's engineer/conductor, but there should also be a yardmaster/hostler down at the steamup bay in Fog Harbor who can help service the engine.

There are other tricks as well. Installing larger fuel tanks in the engines, and high-pressure watering stations located at places around the layout, equipped with garden-style "watering wands," each tipped for Goodall valves. And of course, standardized couplers. Jack is using Accucraft couplers nowadays "because most of my cars come with them." But Kadees will do as well, with some minor modifications.

The bottom line is that, contrary to the sceptics, live-steam ops is "do-able." And if you email Jack, he'll send you a printable file of the "Crystal Springs Operation Manual" which will show you how (also see "Scheduled live-steam running with multiple trains," *Steam in the Garden*, March/April 2013, No. 126).

The ultimate dream of many live steamers is to "roll your own" — build your own engine from bar stock and copper sheet; and there is no more elegant or prolific practitioner of this art than Bill Allen. We've seen many examples of his work in this magazine, most recently the French/Algerian Garratt which appeared earlier this year (*Steam in the Garden*, March/April

Murray: *Volunteer steamers (on right) supported Richard and Melinda's layout when bus visitors (left and center) arrived.*

Construction: *Building his shed first gave Michael Laine (in the 'Keep Calm and Steam On' T-shirt) the confidence to build his all-wood elevated layout. (Author with back to camera.)*

2016-July/August 2016, Nos. 144-146).

Bill presented a two-part clinic at the convention titled "Scratch building live steamers" which was very well attended. As might be expected, this clinic was full of guidelines and design parameters for such Allen specialties as cylinder porting, valve timing and ceramic-burner design.

Surprisingly, Allen does not consider himself to be a "really great machinist." Perhaps this is why he puts a great premium on planning ahead, looking for the series of smaller, simpler steps that will get you to your goal. I found these "procedural hints" to be the most insightful. Bill says for instance, that as you get more familiar with scratch building projects, you will notice that there are some sorts of things that you simply like to do more than others.

So plan ahead, identify those tasks that feel harder, or that you're less familiar with, and do those first! That way, you will have accomplished the hard part and can look forward to getting the easy part done. To do otherwise, he warns, you're likely to simply stall at the hard parts, and risk never getting the project done.

After the convention was over, and everybody had a chance to catch their breath, I was able to ask Richard and Glen, separately, about why they thought the convention, and especially the live-steam component, had gone so well. Their answers were remarkably similar.

First, they said, was the strength of the volunteer effort. The club had a hard core that were determined to make the convention happen, and enough volunteers to support that effort without too many individuals feeling overwhelmed. As the convention grew closer, more and more details popped up to take care of, but the spirit of volunteerism also snowballed, and grew more than strong enough to handle the effort.

But the key to that was surely having enough members to begin with? I was especially surprised to learn that the BAGRS live steam group had grown from about 35 members to more than a hundred in the last four years. How did they do that?

The answer was emphatic — you've got to be proactive. Reach out not just to other members of the club, but the larger community. What sort of local events — food drives, fairs, community picnics — could they come to with their portable layout and demonstrate their interests? In recent years, BAGRS' layout has been popular at the Bay Area Makers Faire each spring, where the group got a lot of attention, especially from the "steampunk" crowd, and enlisted new members, including a Father-and-Son duo who are already becoming proficient at driving coal. And each year for more than a decade the group sets up the layout at the Ardenwood Rail Fair, in the East Bay's Fremont on Labor Day weekend, which is co-sponsored by the Society for the Preservation of Carter Railroad Resources (dedicated to the narrow-gauge builders of the 1870s-1890s, the Carter brothers, who had shops in nearby Newark, Calif.).

So I guess the conclusion is simple — if you want a thriving, active live-steam club, build a portable layout and go show your hobby to the community. Work hard at having fun, but have fun! It's a formula that seems to have worked very well for the BAGRS live steam special interest group.

Changing an Accucraft C-16 from butane to solid fuel

COAL conversion

Text, photos and illustrations by Rob Lenicheck

As promised in the last installment, here's where we make the flanged parts. We'll pick up the project with Step 11 of boiler fabrication.

11. The throat sheet, back head and rear tube sheet all have to be fabricated through multiple annealing steps. Take a look at **Figure 17**, the "boiler formers" diagram. The darker, smaller shapes are the ones which need to made of hardwood; pine will be too soft to be usable. You will need to make two of each of the formers because the copper is clamped between them as you do the forming. The lighter lines surrounding each former are the shape the copper pieces need to be cut to. Probably the best thing to do is to make copies of the sheet and do some pasting of the forms on the hardwood and copper to cut them to size.

12. Once the formers are cut to shape be sure of two things: 1) the bottom of each former should be considered the "datum" or starting point for the copper piece. In other words, the formers and copper are all placed on this datum as a starting position on a flat surface and aligned before you clamp them and 2) one of the edges on one of the two former pairs should be rounded so that the copper can bend easily around it.

13. It's time to again review the process in Kozo's book ("The Pennsylvania A3 Switcher," by Kozo Hiraoka [Village Press, 2001]). Notice that when you do the forming the copper must be squeezed between two formers. You can clamp the formers-copper sandwich in a bench vice. It will take about six to 10 times of annealing the copper to get the material to fully conform to the former. To get the corners of the copper to conform fully use a piece of small diameter dowel to work the copper into shape.

You may also find that it will become difficult to get the copper off of the former once it gets close to being finished. You can remove it by using a small dowel, hammering it against the edge of the copper while the only the former is clamped in the vice.

14. After the three parts are formed you will need to machine all the

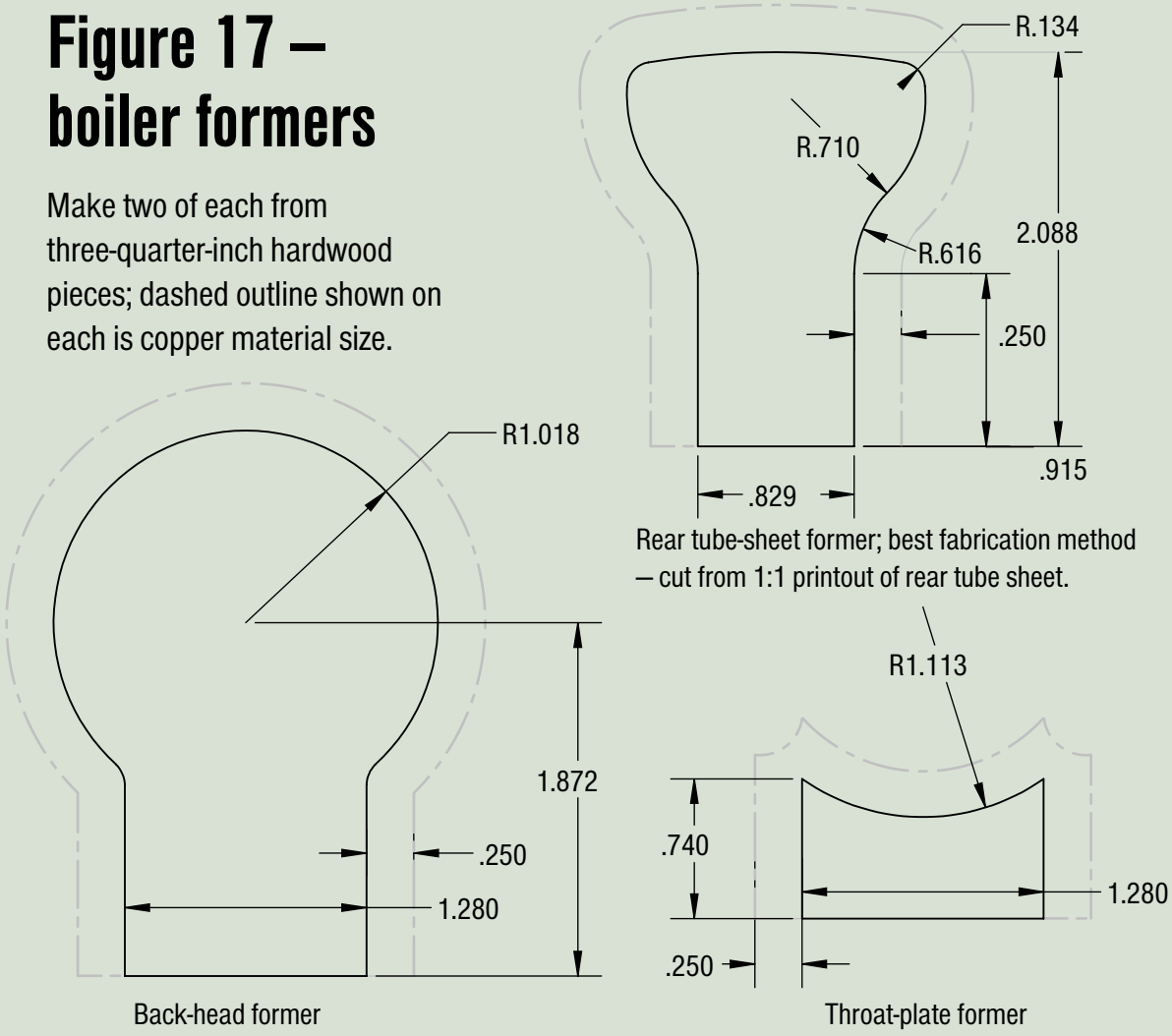
Coal conversion of a C-16

Rob Lenicheck's Accucraft C-16 ran nicely once he got it "tweaked." So nicely, in fact, that it grew boring. What to do? Rob, a committed coal-burner, decided that he would convert the engine to "the dark side." Here's how he did it:

- **Part I:** Designing the valve gear, disassembly, modifying the frame.
- **Part II:** Starting the boiler.
- ➲ **Part III:** Finishing the boiler, pressure-testing.
- **Part IV:** Smoke box, ash pan and grate (in this issue; see Pages 54-58).
- **Part V:** Steam manifold, fittings, blast pipe.
- **Part VI:** Axle pump & bypass plumbing, water glass, wrapping it up.

Figure 17 – boiler formers

Make two of each from three-quarter-inch hardwood pieces; dashed outline shown on each is copper material size.



Rear tube-sheet former; best fabrication method — cut from 1:1 printout of rear tube sheet.

Back-head former

Throat-plate former

holes in the back head and the rear tube sheet. It works well to machine the holes while the parts are still supported by their former.

Note: it is *exceedingly important* to put a little countersink into the edges of the holes for the flue and tubes. This makes it much easier for the silver solder to flow into these areas and do a better job of sealing. Do this on both the front and rear tube plates (**Figure 18**).

15. The throat plate deserves special attention since it tends to be the most difficult to fabricate. The sides should be bent into shape first and then do the top. Notice that the top is flanged in the opposite direction, and therein lies the challenge. When bending the top flange the sides will pull away from the form until you use enough annealings to assure they don't.

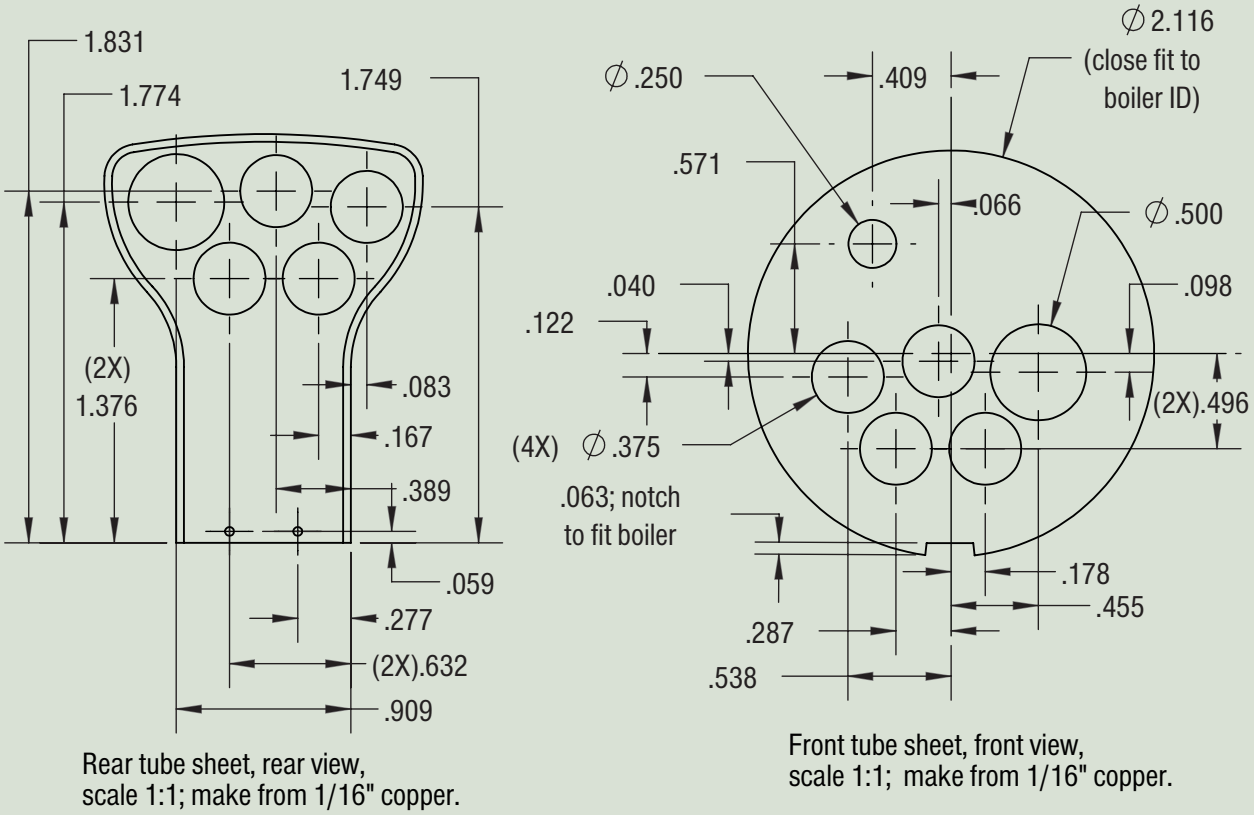
16. Now you have the flanged parts. Dimensions of the finished parts are shown in **Figure 19**. Each of these should be machined slightly to easily mate with the surfaces to which they will be fastened and soldered. Kozo shows you how to do this. To do things right you'll need to make up some fixturing as shown in **Photos 9-11**. Notice that there is a mounting hole I used for the fixture. This was later plugged with a boiler stay.

17. The next piece to solder in is the throat plate. It is critical that it has a good, tight fit against the boiler and fire box surfaces. Attach it with your fasteners and then solder away. The final product looks like **Photo 12**. Notice how the tabs on the boiler/fire box sheet attachment ring have been bent down before soldering.

18. So, is it getting any easier? Didn't think so. Be persistent. Time to bend up the crown sheet. From this point on you're going to have to pardon the pictures which won't match with what the prints display. The pictures were taken in my second attempt at the design which didn't work. The construction sequence, though, is still identical.

Cut, score the bend lines and anneal the crown sheet. This is no doubt the toughest piece to bend. The score lines are in the middle of each radius; in other words, do the bending in either direction away

Figure 18 – boiler tube sheets



Rear tube sheet, rear view,
scale 1:1; make from 1/16" copper.

Front tube sheet, front view,
scale 1:1; make from 1/16" copper.

from the lines. Now that you have your rear tube sheet formed you can match up your bends with the tube sheet profile.

19. Fabricate the crown sheet stays – you need two. Thread and fasten them back to back and solder them together. Once that's done they can be soldered to the top of the crown sheet. (**Figure 20** and **Photo 13**).

20. At this point it's handy to have the front tube sheet made up so you can use it for support when you solder your tubes/flue in. An easy way to make the part is to rough cut it and then attach the piece to a large, round and true piece of brass with cyanoacrylate. Chuck the brass into the lathe and turn it to size to fit your boiler tube. When you're done simply heat the brass up and the part will fall off. To drill the tube/flue holes I hold the part on the mill vice to locate and drill. Yeah, you'll get a little flat on each side, but this is easily filled with solder when you join the parts. Notch the bottom to clear the mating strip in the boiler tube. **Photo 14** illustrates the process.

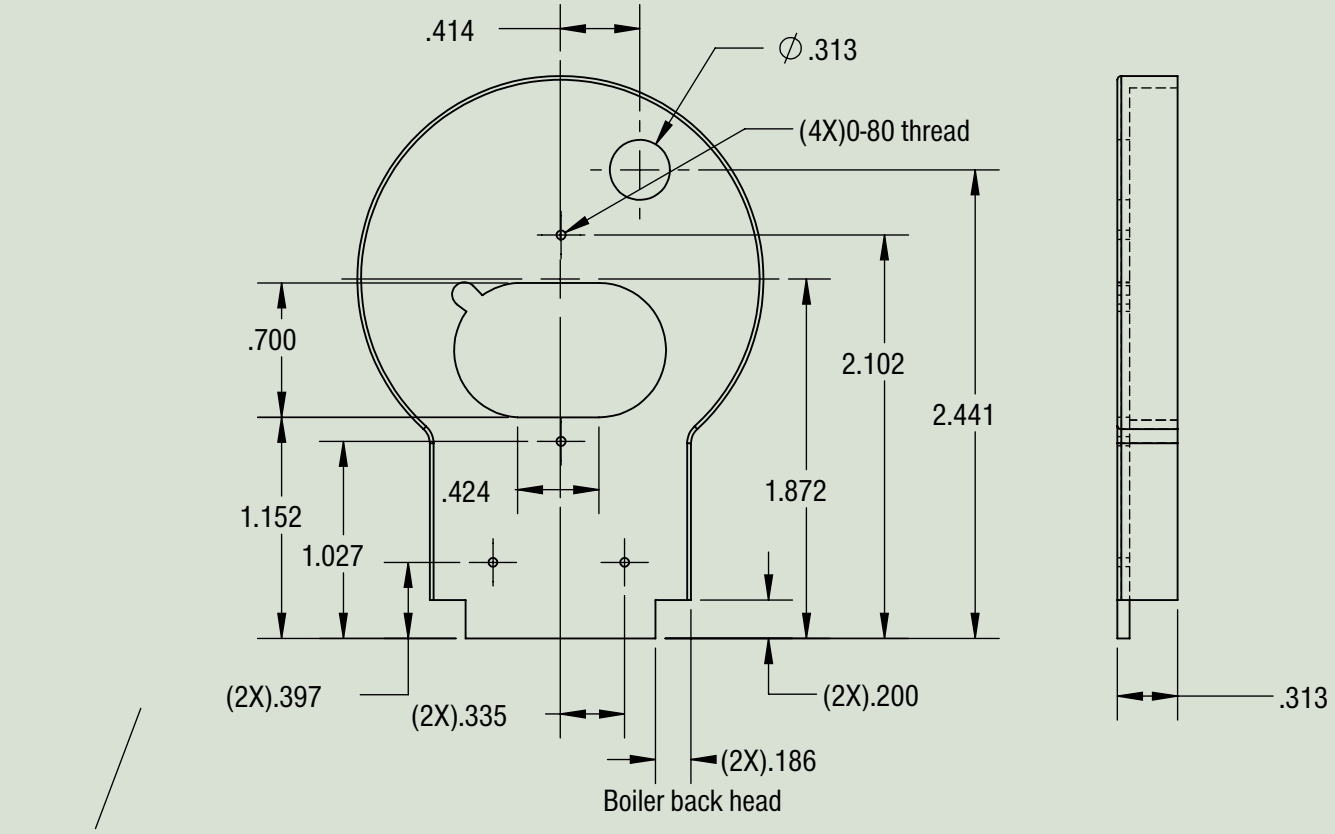
21. The next fun step (seriously!): soldering the tube/flues into the rear tube sheet and into the crown sheet. Before you do this be particular about the flatness of the rear of the crown sheet where it will mate with the back head, since this is a butt joint. Use a piece of plate glass with some wet/dry sandpaper and work the end surface. Check the flatness by trying to rock the part from opposite corners while on the glass.

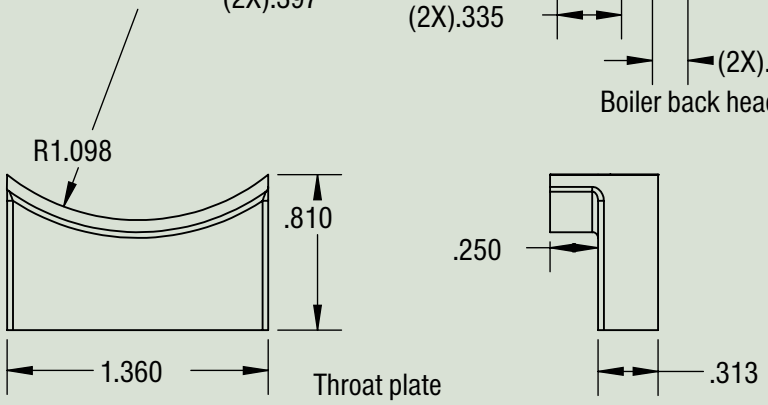
22. Place the rear tube sheet into the end of the crown sheet and secure it with your fasteners (**Photo 15**). It should be reasonably square to the crown sheet. Go ahead and solder it in. Once that is done put the tubes/flue into their respective holes, overlapping the inside of the fire box by about 1/16-inch. Place the front tube sheet at the other end of the tube group to align and support them while you solder. Now place the assembly with the tubes up, trying to get the tubes to be as vertical as possible by checking with a large square. (Kozo recommends soldering the tubes in from the inside of the fire box. I just find it's easier this way. And there's a good chance you'll be soldering the joints again from the inside when leaks appear during testing.) See **Photo 16**.

23. Notice in the picture that the back head has been placed under the crown sheet and has been fluxed. As an extra precaution I like to weight the end of the tubes sticking up in the air so that the crown sheet stays as flat to the back head as possible during the soldering.

Incidentally, you might have noticed the white substance at the bottom of the back head surface.

Figure 19 – boiler parts (second page)





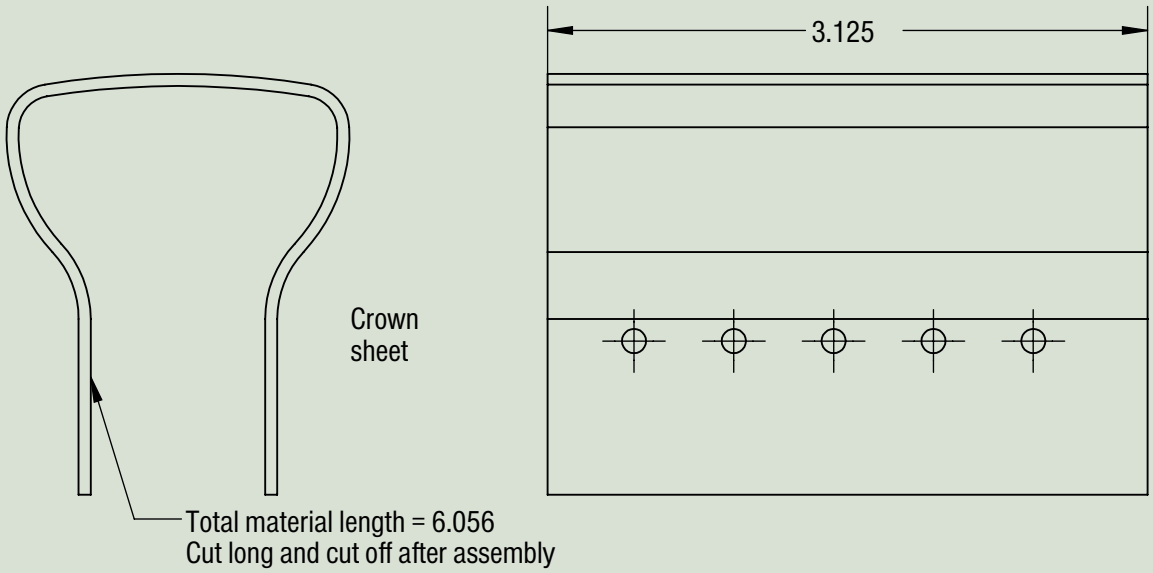


Photo 9

Photo 10

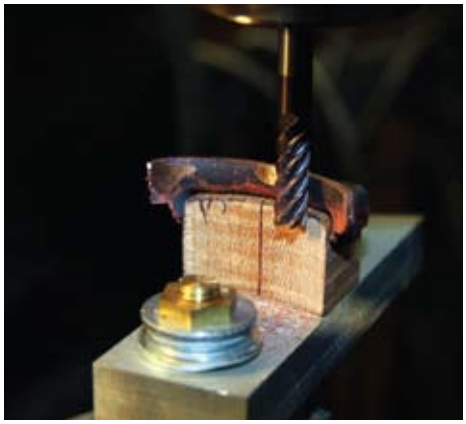


Photo 11

Photo 12

Photo 13

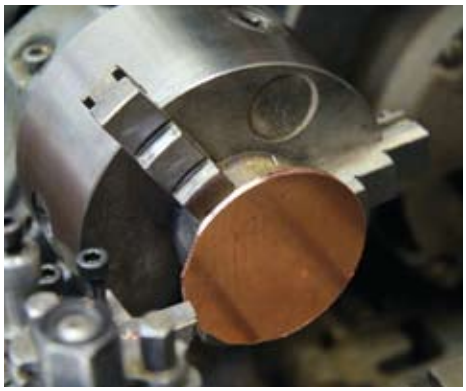


Photo 14

This is "White Out." Yup, the correction fluid used on stationery. It is covering up a threaded hole and since it's a contaminant the solder won't flow there. After aligning everything and making sure the bottom legs are symmetrical to the flanges of the back head, with maybe a slight overlap of the edge, go ahead and solder away.

24. At this point it's time to deal with the back head. Slip the back head and fire box assembly into the boiler, then look down the boiler from the front end and verify that the crow sheet stays clear the dry pipe. If necessary file the stay so it doesn't interfere. Now put the front tube plate into position at the front of the boiler - don't commit to the ultimate placement for the front tube plate yet. Just get it close with the tubes into their holes a bit. Work the assembly into position so the back head sticks out just slightly beyond the fire box wrapper. Drill the holes for the fasteners but don't solder things in yet.

25. The parts to be placed on the back head need to be fabricated and placed prior to soldering. Let's start with the blower pipe which runs through the top of the boiler. Referring back to **Figure 16**, "Boiler fittings," in Part II, make up the back head blower bushing and the front tube plate blower bushing. (Be particular with the fit of these since they will be inside the boiler and you won't have access to them if they leak.) The front tube plate bushing should be a tight slip fit into the hole in the front tube plate. Solder a length of one-eighth-inch copper tubing to the back head blower bushing that's long enough to go through the front tube plate. Before you solder on the front bushing to the tube make sure that the length is correct so that the all the 1/4 x 40 threads of the bushing stick out of the tube plate. In other words when you solder the bushing into the front tube plate you'll be soldering to the non-threaded portion. Your blower tube should look like the one in **Photo 17** after you complete the assembly.

26. Finish up making the rest of the parts for the back head: the two boiler hold-downs, the fire box door hinge plate and the fire box door strike plate. (**Figure 21**). The finished back head prior to soldering looks like **Photo 18**.

27. The soldering operation for the back head should happen with the back head up. I think it's a good idea to support the end of the tubes with something so that the tube/crown sheet assembly doesn't tend to pull away from the back head during soldering. I usually clean up the front tube sheet and put it in place in the boiler tube. (The blower tube should be in place, also.) This usually supports it sufficient-

Photo 15

Photo 16

Photo 17

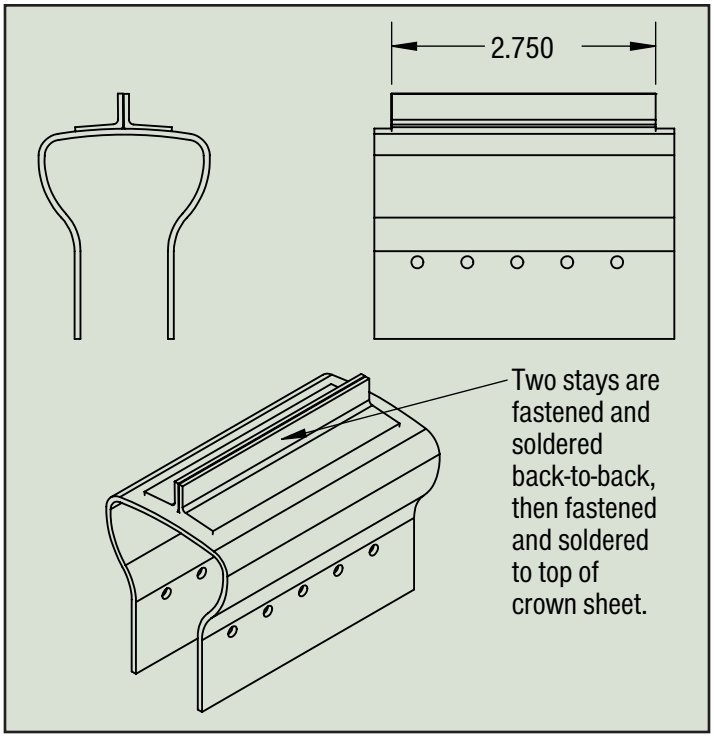


Figure 20

ly. Flux everything up and solder the entire back head and attachments at one time. Then, provided you cleaned the front tube sheet prior to soldering the back head on, flux it up and solder it in place.

28. Time to do the fire box stays. The stays are one-eighth-inch copper rod. I have tried fitting both threaded and non-threaded stays into the inside of the fire box. I don't think there's any advantage to the threaded kind as long as the fit is tight enough to hold the stay in place during the soldering of the non-threaded type. Locate and drill your holes for the stays. It's important to put in a little countersink in each hole on the outside and inside surface of the fire box. This lets the solder flow into these holes for a better joint. Overlap the stays about 1/16-inch on the inside of the fire box and solder that surface first. Then do the stays on the outside surface. If they're too long they can be cut off with a rotary tool after you're finished.

29. The boiler is now almost complete except for the mud ring along the bottom of the fire box. Notice that the fire box sides hang down into the frame 0.200-inches. The back head corners now need to be relieved to allow this. Also, you may find that the fire box walls need to be trimmed to measure the 0.200-inches. I have tried machining this but it's tricky and tedious. If you're careful it's quicker to buzz them off with a cutoff tool. The dimension you should shoot for is the 2.792 inches from the top of the crown sheet wrapper to the bottom of the fire box sides. (Refer back to **Figure 14** in Part II.) It's probably OK to be a bit off on this dimension but it should be fairly close.

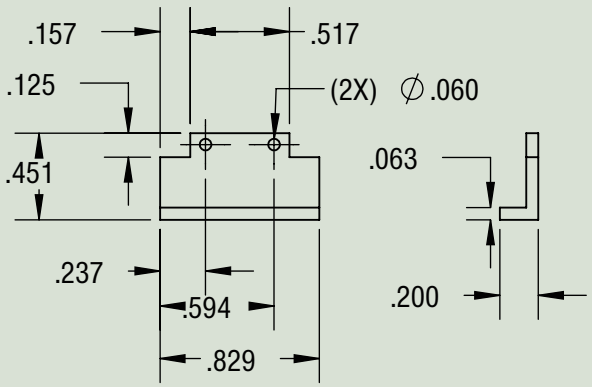
30. The mud ring needs to be made up from (and this is important) one-eighth-inch thick copper. The additional thickness really helps with sealing the boiler with solder. Make up three pieces that are approximately sized to your slots. Once you have them blanked out you need to file them to size. If your boiler is like ones I have made nothing will be square, so you really need to just take your time to make sure they are right. The first two should look about like **Photo 19**.

Strive to get them to be a close fit, both to the walls and to the adjacent piece. The better the fit, the better the seal. I have usually attempted to have the pieces be a light press fit. When you're satisfied with the fit clean everything up and solder away. Your finished product will look like **Photo 20** – or maybe a little prettier.

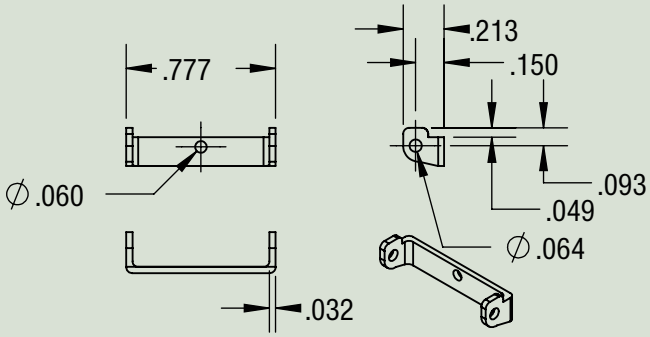
31. Lastly, the boiler needs to be pressure tested. I make up fittings for the top of the boiler which can accommodate a pressure gauge and water intake from a hand pump. You need to make up boiler plugs for the rest of the holes. Do a good job of sealing these plugs for the reason that it's easier to pinpoint where the leaks are coming from if not from

Figure 21 – boiler additions

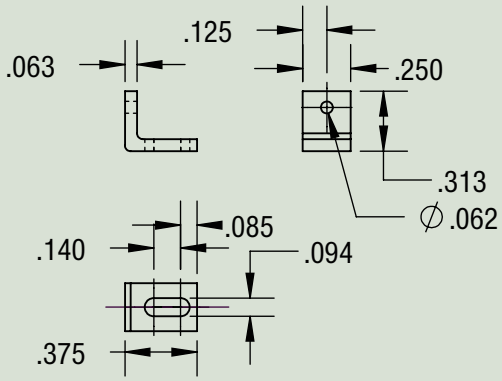
Make from brass except as noted



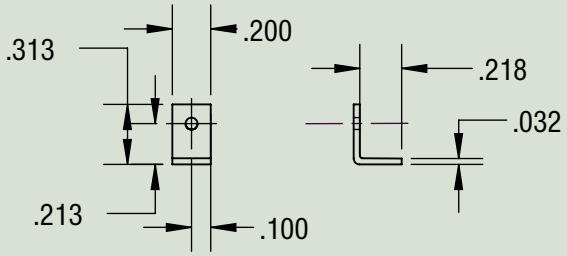
Grate stop



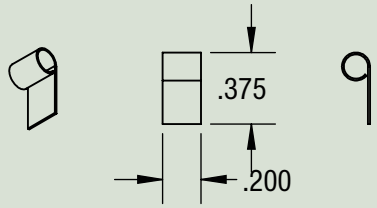
Fire-box door hinge plate;
total material length before
bending = 1.14"



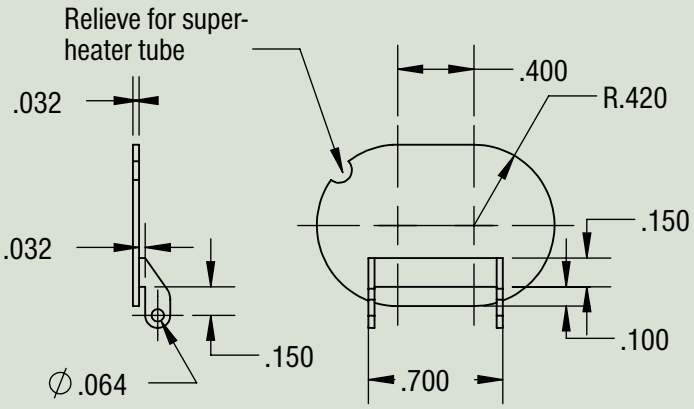
Rear boiler hold downs;
make two.



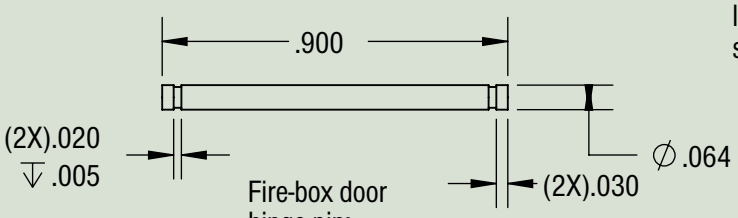
Fire-box door strike plate



Fire-box door retainer spring;
make from .010" stainless steel;
attach to door after door is
positioned on back head.



Fire-box door; make from stainless steel;
hinge from brass OK;
locate from boiler and silver
solder hinge to door



Fire-box door
hinge pin;
make from stainless steel
scale 2:1

Photo 18

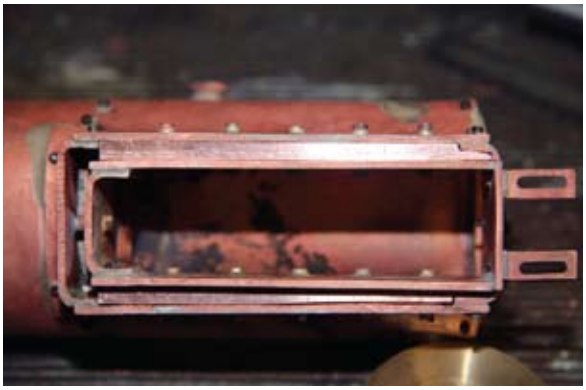


Photo 19

Photo 20

the plugs themselves. The boiler should be able to withstand double the working pressure for about 10 minutes with no leaks. I shoot for 140 psi, for a working pressure of 70 psi. (**Photo 21**).

The boiler will probably leak and, most likely, from somewhere inside the fire box. (Oh, fun!) If that is the case, pickle the boiler and place the surface needing to be sealed horizontally so the solder can flow. Flux the area and add a few bits of solder if needed. It's helpful to make some shields to cover the mud ring while you solder if that area might be hit by flame. The shields eliminate a reflow possibility there. Also, if you are soldering inside the fire box I have found that a smaller Sievert head works better – the No. 2941 head works nicely.

Photo 21

Well, that's it. You've done it. Time to break out the Dom Perignon. In the next installment (see Pages 54-58 in this issue) we will make our ash pan and grate, and seal up the smoke box.

Veteran steamer makes first visit to National Summer Steamup

Volcanos TO steaming

Text and photos by Harlan Chinn

Living in Seattle and being a member of the Pacific Northwest Garden Railway Society Live Steamers has its benefits — including fellow club members in the region with sizeable garden railroads designed specifically for our live-steam model addiction. Stu Buchan's layout in Bellevue, and Peter Comley's Sunset Valley Railroad in Sumner, Wash., are examples. And Staver Locomotive, a mere three-hour drive south in Portland, Ore., hosts steamup events at least twice a year, offering extensive runs on a lengthy, beautifully landscaped mainline layout.

With 14 years in the Gauge One live-steam hobby — all the while reading articles about and hearing about several of our local contingent's experiences at both of the major annual steamup gatherings, in Diamondhead, Miss., and Sacramento, Calif. — I really didn't have the right motivation to make either one of these steamup pilgrimages.

Then it happened, at last fall's Staver Locomotive steamup in Portland: my friend in the hobby Dan Pantages of South Surrey, British Columbia, asked if I would like to road trip with him down from Seattle to attend the 2016 National Summer Steamup in Sacramento, scheduled for July 13-17.

The months quickly elapsed and the road trip became reality when I was fortunate enough to get an architectural design contract onto the books before the steamup dates. With much anticipation, I packed up a couple of the trains that I planned to run — I would take full advantage of this great opportunity to travel with Dan and steam trains at a venue new to me.

The plan was for Dan to drive down from Canada

Ring of fire: *Mount Shasta in Northern California.*

Firing tips: *Rich Threlkel, left, explains to Larry Staver, right, how he runs his Aster NYC Hudson.*

'Enormous': *Seven of the eight layouts that are available are visible here; Paso Robles oval at the bottom.*

Unpacked: *And electrical outlets in the floor.*

Friends: *Jim Hadden, left, and Kevin Schindler set up their trains while Dan Pantages and Dwight Ennis supervise their work at the PCLS layout.*

Tuesday, so that we could get an early morning start Wednesday for what would be an extended day-long drive. The 760-mile drive from Seattle to Sacramento — according to the GPS — was around 10½ hours, plus some time for gas and meals. We had the car packed and were ready to head out at 6:30 a.m.

Driving south on Interstate 5, Mount Rainier stood out proudly against the clear blue morning skies, and I realized that we were traveling along the West Coast "Ring of Fire" chain of dormant volcanoes as well as national parks. Cruising down the interstate we passed the first two of the five volcanoes — Mount Rainier and Mount St. Helens in Washington State. St. Helens was last active in 1980.

We made a brief stop in Portland to pick up Dan's locomotive, where we drove over the uniquely graceful Highway 30 gothic arched St. John's Bridge on our way back to Interstate 5.

Continuing south, we would see in the distance majestic Mount Hood while heading into the track-and-field town of Eugene, Ore., which was our first stop for fuel. We pushed on through for a quick lunch at the northern-most location of In-N-Out Burgers in Medford, Ore., before we were again on the road past Crater Lake, over the Siskiyou and into Northern California.

We made a stop for fuel in the foothills of Mount Shasta, driving past the fifth and final volcano of the ring before continuing onward toward Sacramento.

Approaching the outskirts of Sacramento at dusk, with the sun low on the horizon, we finally arrived at the McClellan Conference Center in the dry evening heat at around 9 p.m. After a stretch of our legs we made our way inside to the lobby, which was bathed in colored light from the tinted color entry windows.

There was a line of tables that had the registration desk and steamup apparel for sale. No one was there to welcome us or check us in, so that would have to wait for the next morning.

My initial impression of the conference center was of the enormous size and floor area, where the eight oval layouts of varying sizes were enveloped. We were immediately welcomed and greeted by the familiar faces of steamup friends Craig Griffin, Nick Fisher, Kevin Schindler and Jim Hadden (just to name a few).

I was told that the layouts were much closer together at the previous location that had hosted the Summer Steamup. Dan and I scoped out table areas to set up our equipment as we proceeded to unload the car.

The lighting levels from the large metal halide uplights was a bit of a challenge, because much of the light was lost after bouncing off of the dark ceiling at night. The lighting levels were just a bit better during the day, with natural daylight filtering through the translucent skylight panels and augmenting the uplight fixtures.

From the main lobby there were ramps at either side of the entry leading to the raised sectional floor

Sign-up board: *Rick Gross running a Cab Forward.*

East Broad Top: *Bill Baxley, left, shows his (for sale) radio-controlled engine to Dr. Louis Burch.*

Butane: *Curtis McCarthy fuels his 4-8-4 S.P. GS-4.*

New loco: *Channing Cheng of Accucraft, left, discusses the Type 1, three-ton Decauville with Jason Kovac of The Train Department.*

of the central room. This floor system allows for flexible locations for power and communication boxes, as well as being an efficient means of distributing cool conditioned air throughout the volume of space.

An outlet box under the table where I set up my trains and work area was an added bonus, as I was able to keep my photographic and computer equipment chargers plugged in and charged. The room was large enough that there were generous amounts of aisle space around each of the layouts.

There were tables set up parallel against the wall along the outer perimeter walls of the room, where people worked on their trains with their backs to the conference space. I might have arranged some of these tables perpendicular to the wall in a peninsula layout so that participants could better interact with one another. But that's just the architectural space planner in me.

After dropping off our things we found Sonny Wizelman roaming the hall. (We were rooming with him in a suite at the Lions Gate Hotel and wanted our room keys.)

The hotel, while on the same vast former Air Force base complex as the conference center, is far enough away to make walking to and from one to the other completely out of the question (especially in the heat of Sacramento in July).

The accommodations were pretty nice and it was apparent that our suite was recently renovated. We hadn't had dinner and it was already just after 10 p.m., so we sought out something to eat at the hotel's bar, only to learn that the kitchen had just closed. Not being familiar with the area, our dining options were pretty limited at that time in the immediate area.

The next morning, Thursday, began like every subsequent steamup morning: the all-important multiple cups of coffee and breakfast at the hotel restaurant with the rest of the steamers. After breakfast we made our way back to the conference center to pick up our registration badges as well as sign up on the board for a few blocks of running time.

My equipment was set up on the tables within the Paso Robles layout, including the trains that I brought down to run — my recently rebuilt Aster Great Northern S2, an Aster Mikado that I finished in GN livery, a dozen GN boxcars as well as a GN caboose that I had

Cab forward: *An S.P. 4-8-8-2 'flat face.'*

Moving: *Rob Lenicheck uses one of the many carts.*

designed and made up from a laser-cut kit.

The Paso Robles layout is one of the two larger double-loop setups (the other is the PCLS) that had a large sign-up board for track times at 30-minute intervals. At times that seemed a little rushed, but all in all it provided a chance for more people to run.

It was interesting to see participants gravitate to specific layouts, as it became apparent which were mostly narrow gauge and which featured long main-line equipment. However the abundance of wheeled

S.P. AC fanatic: *Alan Redeker fires a cab forward.*

equipment carts made it easy to move trains from track to track as run times opened up. Thursday and Friday morning and afternoon running sessions felt relaxed and didn't feel crowded at all. I was thoroughly enjoying the smooth run-on and run-off cooperation with fellow steamers.

It was nice meeting and steaming alongside knowledgeable steamers like Alan Redeker of Queensbury, N.Y., learning about his highly reworked and customized Southern Pacific AC cab forwards, and the equipment that he and others steamers are so passionate about.

The evening sessions of steaming were not to disappoint. For instance my fellow Washingtonian Eric Bowles ran his Aster Union Pacific FEF-3 with the assistance of Ryan Bednarik of Mount Holly, N.J., pulling a 22-car fully lit "Portland City of Roses" smooth-side passenger consist.

For me the highlight of the trip was to see in person Bill Allen's French Railroad PLM's Algerian streamlined Garratt locomotive fired up and run with the equally exquisite passenger cars, lit and fully occupied of course (see *Steam in the Garden*, March/April 2016-July/August 2016, Nos. 144-146).

Having experience in vintage-auto restoration and custom hot rods, I had a much greater appreciation of what Bill had incorporated not only in the machining of the locomotive components, but the precision in forming of the streamlined boiler cover and coach work. The directional head- and tail-lights on each end were beautifully "Frenched" or recessed into the locomotive's fenders.

The shade of green paint finish reminded me of a Granny Smith apple, and appeared to be flawless. Watching the Garratt make its way around the track with its unique valve gear action was like looking at the works of a fine Swiss watch.

To one side of the conference center was the dealer room which was active and seemed to reflect the

Complete interior: *'Exquisite' passenger cars for Bill Allen's PLM Algerian streamlined Garratt.*

Learning: *Bob Sorenson gave one of many clinics.*

"pulse" of the hobby with manufacturers Accucraft Trains, Triple R Services and Wuhu Brand Arts & Crafts Co. Ltd., to name a few, all in the same room.

With the apparent market success of the Accucraft smooth-side passenger cars, it appeared that there were several other attempts at producing variations of 1:32-scale heavyweight passenger cars. There were several pre-production design models of both laser-cut wood as well as 3-D-printed and resin-cast cars set out on tables for further review and discussion.

I was able to meet Accucraft's Bing Cheng for the first time after all these years — as we had missed each other the last time I was able to stop by the Accucraft facility in Union City, where Cliff and Judy Luscher are always friendly and helpful.

I had the opportunity to meet Leon Chen, a representative with Wuhu Bowande, where I had a chance to exercise my not-so-good Mandarin Chinese. But coupled with his limited English, we had some great conversation about the products Wuhu Bowande plans to bring to the market.

I was quite impressed with the fit and paint finish of Wuhu Bowande's silver and yellow sample of the Chesapeake & Ohio Hudson 490 streamlined locomotive, as well how smooth the company's BR64 was running. Ceramic burners seemed to make the company's locomotives run efficiently and quietly.

A first-time trip to Sacramento would not be complete without a visit to the California State Railway

'City of Roses': *Ryan Bednarik, left, helped Eric Bowles run his Union Pacific FEF-3 one evening.*

Next generation: *Debbie Bartle shows her grandson, Simon, how to operate a live steamer.*

Museum. Dan was kind enough to take me down to the museum in the Old Town section of Sacramento. It was so much worth the price of admission with so many pristine examples of SP steam locomotives. I can understand how Accucraft has been able to produce so many SP locomotive and rolling stock models with access to these beautiful examples.

I was only able to attend one of the clinics, this one presented by Michael Martin on "Photography Techniques" in the hobby. As a longtime photographer, it's always refreshing to see other photographers' presentations, and hear about their approach and perspective on photography.

The Saturday evening barbecue dinner experience was interesting, as the group was split between those sitting outside and those who had to sit indoors, because of what seemed to be the lack of enough

Back 'sooner ... than later': *The author running his Great Northern. Photo by Carla Brand Breitner.*

seating outdoors. It would have been nice to have everyone together in one place, something that I have become accustomed to at other steamups.

The evening concluded with a gathering for the award and door prizes, and I was fortunate enough to come away with a narrow-gauge flatcar, thanks to the sponsors.

According to organizer Chris Coley, there were 130 steamers registered, with 33 observers with another 30 guests in attendance at this year's event. According to a hotel executive I spoke with, the conference center will be undergoing a renovation where the low lighting levels will apparently be addressed; so with any luck we'll be able to shoot photographs at a setting less than ISO 1600.

As Sunday morning came it was apparent that anyone with a lengthy distance to travel was already packed and gone, with the exception of Dan and me. The vast conference center space echoed in silence as Dan and I moved our boxes out.

All in all, I felt quite satisfied in that I'd had no problem getting all of the track time that I wanted during the three full days of the steamup. As Dan and I packed the last few of our boxes into the car, reflecting back on my first experience at the 20th annual National Summer Steamup with a greater appreciation for the many exquisite steam models and modelers that strive for unique designs and innovation in their live steam models. It was a great experience meeting and placing faces to the names of the many contributors in the online forums, while making new friends as well as catching up with old familiar ones. The steamup felt much like attending an extended family reunion.

Thanks to event organizers — Chris, Tony Dixon, Craig Griffin, Jim McDavid, Bob Sorenson and Bob Trabucco — for their kind hospitality. I will most certainly return to another National Summer Steamup — sooner rather than later.

Adding two wheels gives Accucraft's engine new character

'DORA' wheelie

Text, illustrations and photos by Marc Horovitz

In this final installment of adding wheels and a bunker to Accucraft's "Dora," we'll be making the bunker tank. I suggest, when building this tank, to use brass, between 0.015- and 0.020-inch thick.

Cut a piece to size to make the outer tank wrapper. Mark out the tank as per the drawing or, if you're lazy like me, simply make a photocopy of the drawing and glue it to your metal. The sides of the wrapper are left deliberately long — we'll trim them later.

The curved corners of the wrapper must now be bent. They are the shaded area on the drawing. When finished, the corners should snugly fit a one-half-inch rod. However, you can't bend them around a one-half-inch rod because they'll always spring out a little. So we'll start with a one-half-inch rod, then move to something smaller, say three-eighths-inch. What's important is that the outside dimension of the formed tank be as close to 3½-inches as possible.

Grip a piece of one-half-inch rod in your vise, with around 2½-inches sticking out. Carefully align one of the bend lines with the center line of the rod (**Photo 72**). The work must be square with the rod. You can tape it in place on the rod to help ensure squareness, if you like (**Photo 73**). Then bend the shaded area about 90-degrees around the rod (**Photo 74**). When you let go, it will spring back some. Don't worry about that just now. Do the same with the other corner. Your piece should now look something like **Photo 75**.

Completed: *Including the 'bling' of a coal load.*

Replace the one-half-inch-diameter rod in your vise with a three-eighths-inch rod. The next step is difficult to describe. You must massage the corners until they are round (close to one-quarter-inch radius — use the bending guide in the drawings), the sides are square (**Photo 76**), and the overall width is as close to 3½-inches as you can get it (**Photo 77**). If the corners are not exactly to the right radius, that doesn't matter. What matters is that they look right.

Put some layout dye on the edges of your tank, as per **Photo 78**. The sides of the tank should be 1.700-inches wide, as measured from the back wall. Mark

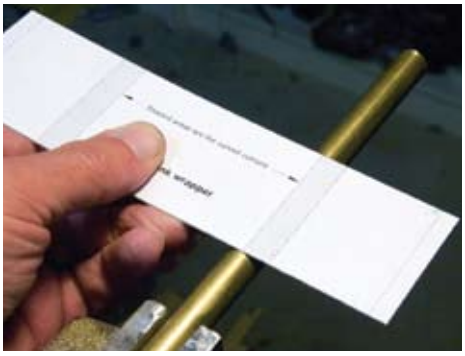


Photo 72

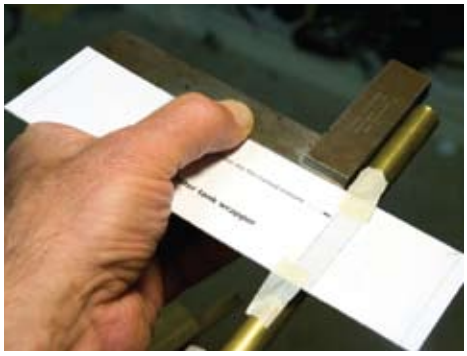


Photo 73

Photo 74

Photo 75


Photo 76


Photo 77


Photo 78

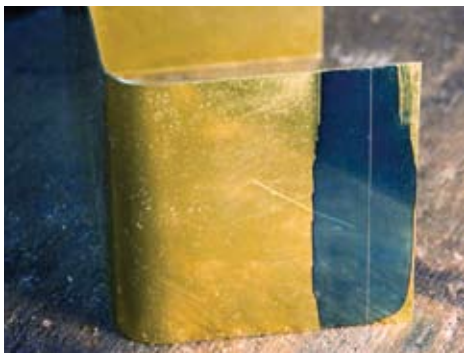


Photo 79

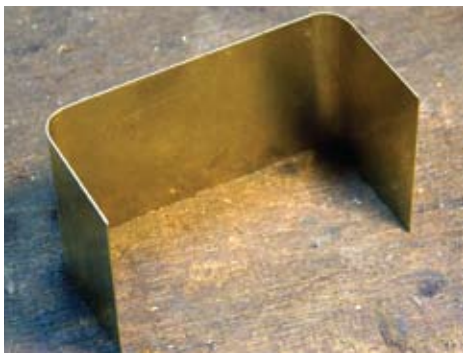


Photo 80

the sides (**Photo 79**) and cut off the excess. The finished tank wrapper should look like **Photo 80**.

To make the tank top and front wall, cut a piece of brass 3.460-inches wide (if you are using 0.020-inch-thick brass), and perhaps one-half-inch longer than the dimension on the drawing. This piece should fit smoothly inside the tank wrapper (**Photo 81**). Mark the fold line right in the middle of the piece.

Then, measuring from the fold line and the edge, mark the location of the hole (**Photo 82**). Center-pop the hole and drill it 3/16-inches (or whatever the minimum size your step drill is). Then, with the step drill, open the hole out to one-half-inches (**Photo 83**). Clean up the burrs.

Grip the work in your vise, with the fold line even with the tops of the jaws (**Photo 84**). Then, with a block of wood, bend the exposed part of the sheet over 90-degrees. A mallet or hammer will help with this operation (**Photo 85**). You want the sharpest corner you can manage without deforming the work (**Photo 86**). Chances are, you'll have bent the metal past the 90-degree point. If that's so, just bend it back again until it's square (**Photo**

Giving 'Dora' more wheels

A new wheel arrangement gives the stock Accucraft "Dora" a significant change in character. Marc Horovitz added a new rear truck and a larger bunker to make her a 0-4-2T.

- **Part I:** Disassembling the engine, modifying the frame and starting the trailing truck.
- **Part II:** Finishing the trailing truck build and begin sheet metal work on the new bunker.
- ➲ **Part III:** Completing the bunker and finishing the project.

Half-round wire

The top of "Dora's" new bunker, like many things railroady, will be trimmed with half-round rod. This stuff is not easy to find but it is surprisingly easy to make yourself.

There are several ways of doing it. One is with a draw plate, but this is a special piece of equipment. Jewelers use them to produce special diameters and special shapes of wire (i.e., square, half round, triangular and similar). Another way of producing half-round wire can be done on a lathe. You wrap the round wire many times around a mandrel, tightly securing both ends. You then turn away half the diameter of the wire while the lathe is running at a moderate-to-slow speed. I've done this and it works. However, I've found it difficult to secure the ends tightly enough.

The method I like involves a milling machine and a simple tool that can be held in your milling-machine vise. Included here is a drawing for it. It's simply a block with a 1/16-inch hole drilled in it (we're going to make 1/16-inch half-round). A slot is cut into the middle, half the depth of the drilled hole. Making this tool is a simple milling job, so I'm not going to describe it here — the drawing and **Photo A** should explain it.

In use, grip the tool in your milling-machine vise, with the hole oriented along the long axis of the milling table. Take a piece of 1/16-inch rod (three-feet long is great but a foot-long piece will work too) and insert it through the hole, leaving about an inch sticking out the other side (**Photo B**).

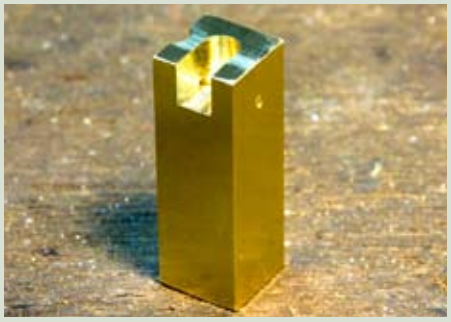


Photo A

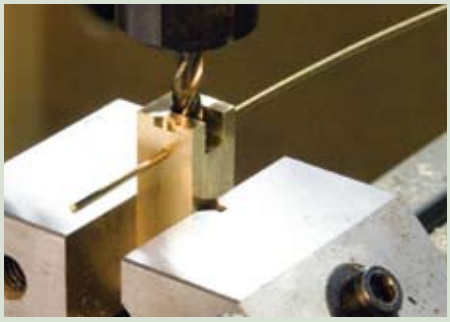


Photo B

Photo C

Photo D

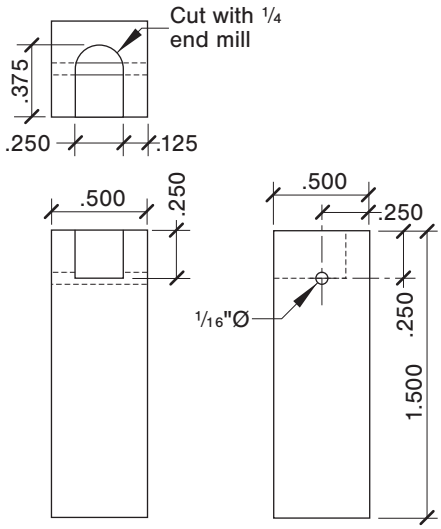
Grip the rod with a pair of pliers, turn on the mill, and bring the cutter down so that it cuts halfway through the rod. Then, with the mill still running, slowly pull the rod through the hole (**Photo C**).

You'll end up with a three-foot piece of half-round rod. However, it will most likely no longer be straight. To straighten it, you'll first need to anneal it. I do this on a fire brick, heating one section at a time to red hot.

Once the entire length has been heated, it can be straightened by gripping one end tightly in your vise, grabbing the other end with pliers or locking pliers (Vise-Grips), then gently but firmly pulling on it. You'll need to apply quite a bit of tension. You should actually feel the metal stretch a bit, which will both straighten and work-harden it.

To complete our project, you'll need three pieces, each around eight-inches long (**Photo D**).

— M.H.



Tool for making 1/16" half-round

Make from 1/2"-square bar

87). You can clean off the layout dye now.

The next steps are important to the final outcome of the project, so try to be reasonably meticulous. Put some layout dye on the underside of the top of the tank, as per **Photo 88**. Tape the front/top to the outer wrapper (**Photo 89**). The wrapper walls must be flush with, though outside, the front wall (**Photo**

– Continued on Page 40

ACCUCRAFT MODEL TRAINS

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1:20.3 Scale, 45 mm Gauge
Brass & Stainless Steel Construction, Coal Fired
Available in Black Unlettered, #375 Black w/ Flying Rio Grande, and #375 Green Boiler w/ Moffat Logo
Limited Production

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Brass & Stainless Steel Construction, Butane Fired
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SHAY 28-TON

1:20.3 Scale, 45 mm Gauge
Brass & Stainless Steel Construction, Butane Fired
Available in Oil Burning Bunker & Coal Burning Bunker

HEISLER WSL #3

1:20.3 Scale, 45 mm Gauge
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Quisenberry Station
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Sunset Valley Railroad
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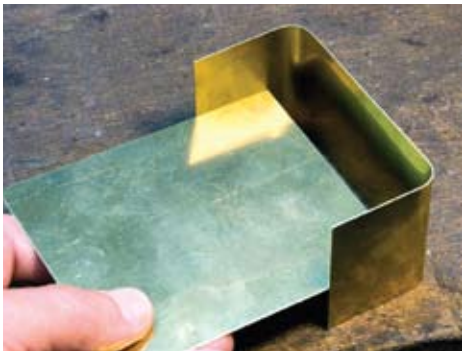


Photo 81

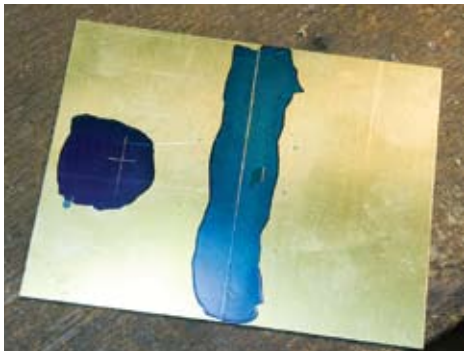


Photo 82


Photo 83

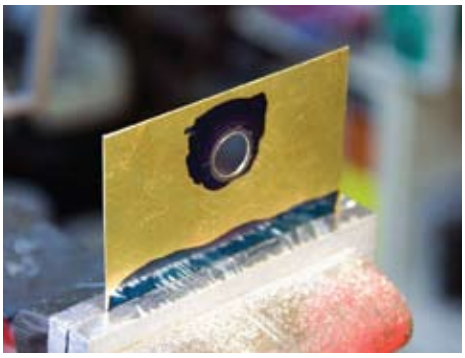
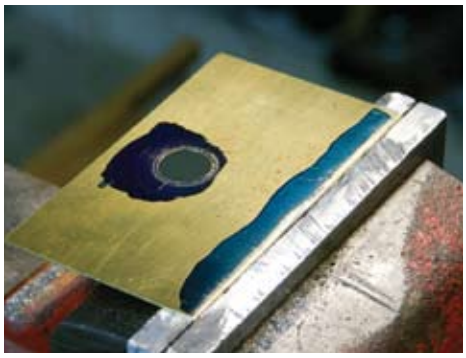


Photo 84


Photo 85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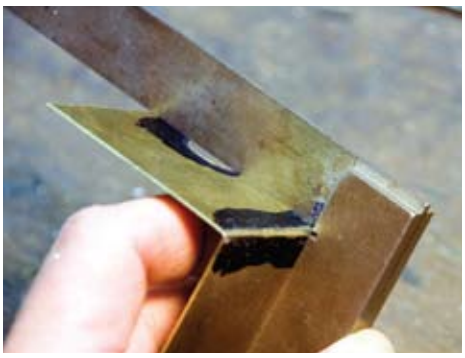


Photo 87

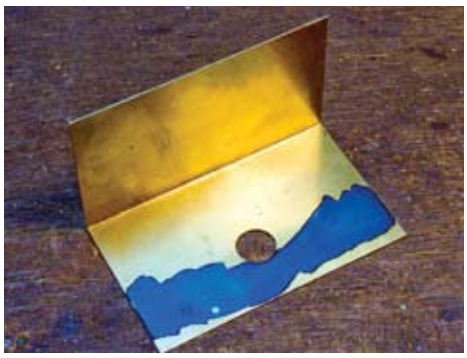


Photo 88

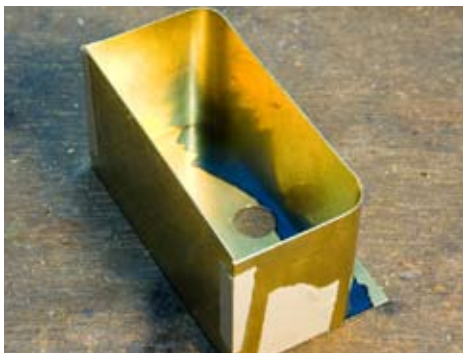


Photo 89

– Continued from Page 37

90). The excess material on the top of the tank will extend beyond the wrapper. With a sharp scriber, scribe a line where the wrapper sits on the top of the tank (**Photo 91**). The resulting line (**Photo 92**) will be the trim line for the top.

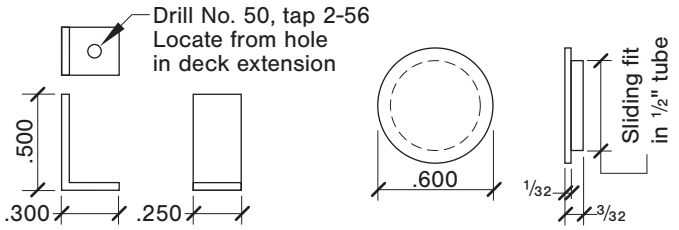
Trim off the excess material from the top. I used a belt sander to round the corners to the line. Measure from the top of the tank 1.750-inches down the front wall. Mark that dimension and trim that as well. The finished part, taped in place in the wrapper, should look like **Photo 93**.

The next thing to do is to solder the two pieces together into a single unit. This is probably best done with a torch. Naturally, you can't solder the pieces while they are taped together, but they do need some help to stay in position. I like to use soft iron wire. **Photo 94** shows the two pieces wired in place.

Flux up the joint, heat it up with your torch and apply soft solder to the inside of the joint. If you want to, you could add a couple of small angles to reinforce the joint (**Photo 95**). If you'd rather not, it should be fine. There's virtually no stress on the joint, so it should not be in danger. The soldered-up unit can be seen in **Photo 96**.

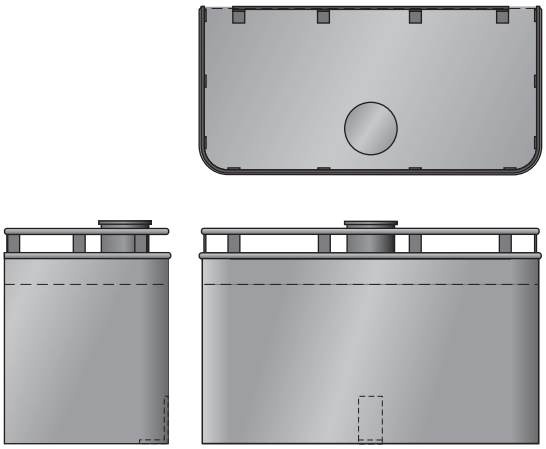
Remove the small bunker from the cab by unscrewing the two hex screws inside the cab. Take the new bunker and apply some layout dye to the front wall, as per **Photo 97**. Place the cab on a flat surface and tape the new bunker in position (**Photo 98**). Using a sharp scriber or a pin, scribe circles on the front wall of the bunker through the screw holes in the back of the cab. This will give you the locations of the holes for the screws (**Photo 99**). Center pop the middles of the circles, drill No. 50, and tap the holes 2-56 (**Photo 100**). Set the cab aside.

Chuck up a piece of one-half-inch-diameter K&S tubing in your lathe and, with a sharp-pointed tool,

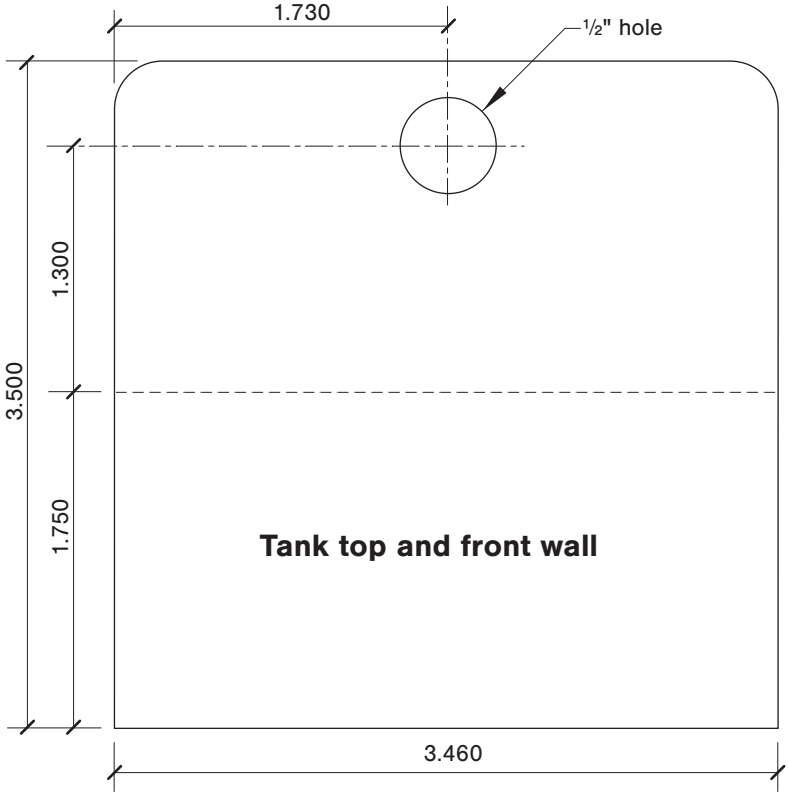


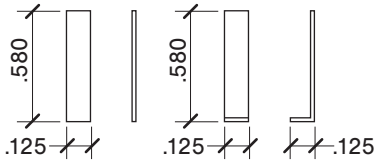
Rear bracket
Make from .040 brass

Dummy filler cap



Tank G.A. drawing (half actual size)

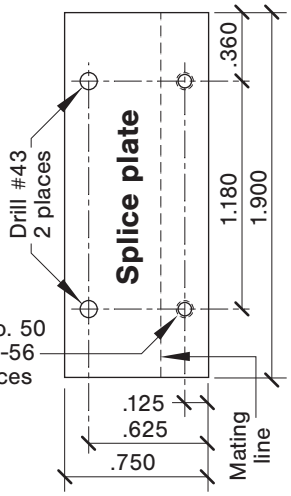


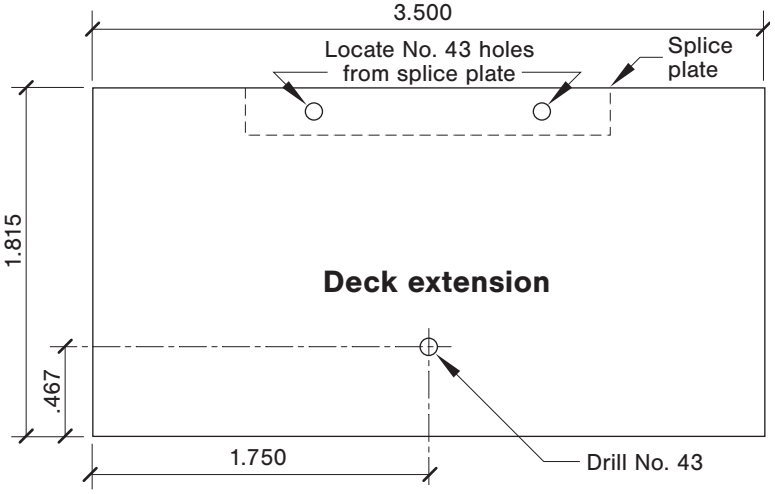


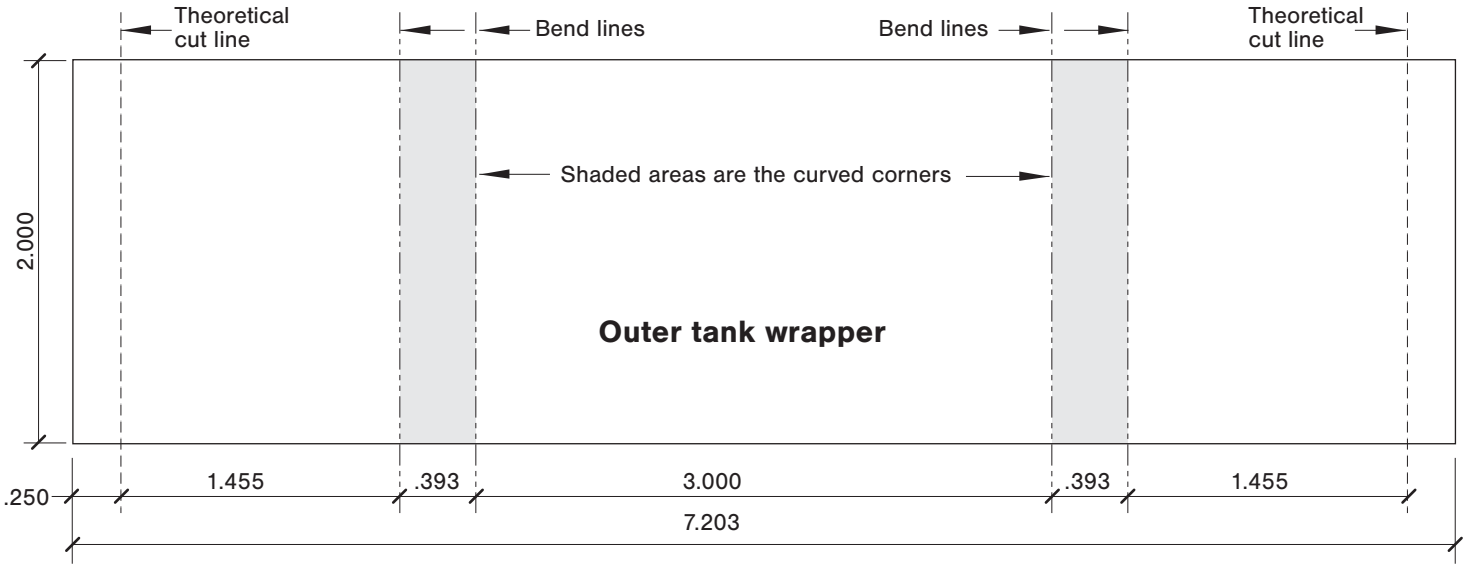
Outside coal-rail support
Make 10

Inside coal-rail support
Make 4

Corner bending guide







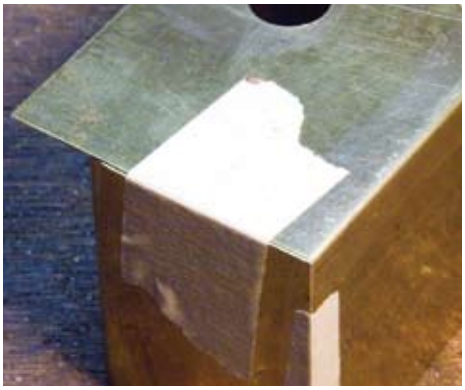


Photo 90

Photo 91

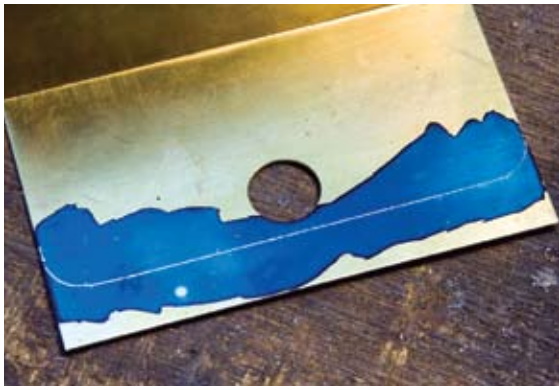


Photo 92

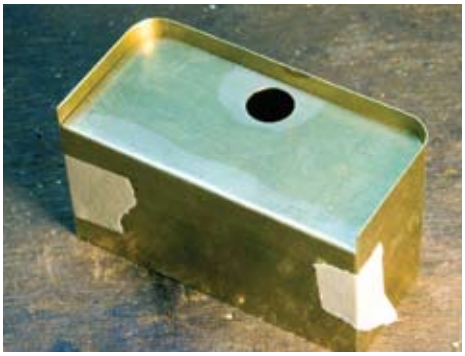


Photo 93

Photo 94

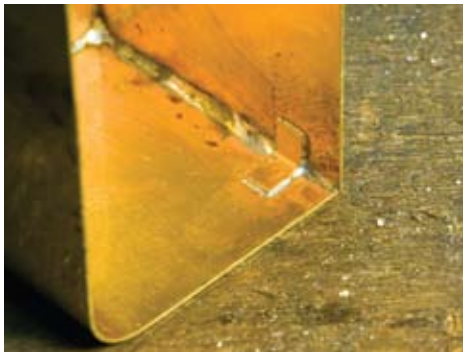


Photo 95

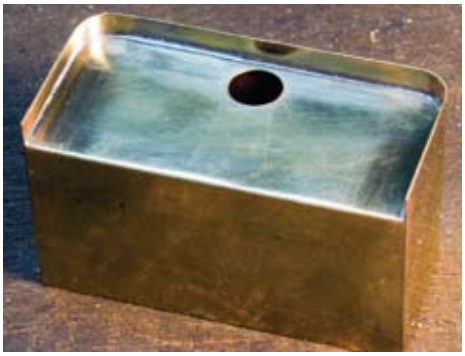


Photo 96

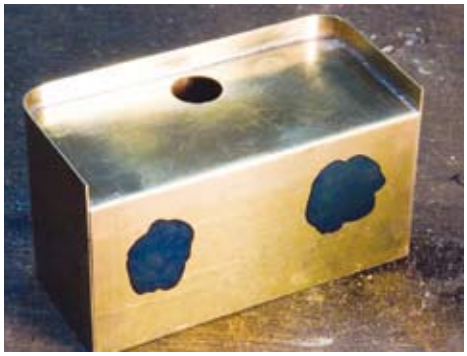


Photo 97

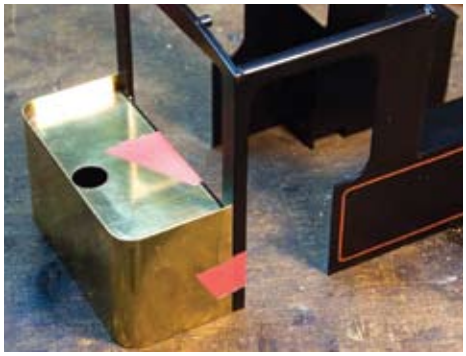


Photo 98

cut off a piece 0.700-inches long and set it aside. Now chuck a piece of five-eighths-inch-diameter brass and turn the end down to 0.600 inches. Come in 1/16-inch and turn that down until it is an easy sliding fit in the tubing you just cut off. Then part that off 3/32-inches from the end (**Photo 101**).

Soft-solder the two pieces together (**Photo 102**). Fit the other end of the tube into the hole, so that the top of the assembly stands about a half inch above the top of the tank. Carefully solder it in place, making sure it is square and that you don't unsolder what you've already done (**Photo 103**).

Dressing up the tank

Before the half round can be applied around the top of the tank, the flat side must be tinned. If the half-round has been discolored through annealing, brighten up the flat side with a small file or sanding block. Then apply a very thin layer of flux to the flat side, along the whole length of the piece.

Solder is best applied with a soldering iron — something in the range of 35-50 watts should do the trick just fine. Apply the solder to the iron, then use the iron to transfer a thin layer of solder to the work (**Photo 104**). Go ahead and tin all three pieces. Try for a thin, smooth layer of solder — no blobs.

The ideal tool to apply the half-round to the tank is a resistance-soldering unit. If you don't have one of these, a soldering iron will do, but you'll need something bigger than the one you used to tin the half-rounds — something around 100 watts should work. If you're really good with a small torch, you could use that as well. Just be careful not to unsolder your work to date.

Clamp the half-round to the top edge of the tank, starting at one end (**Photo 105**). Use lightweight

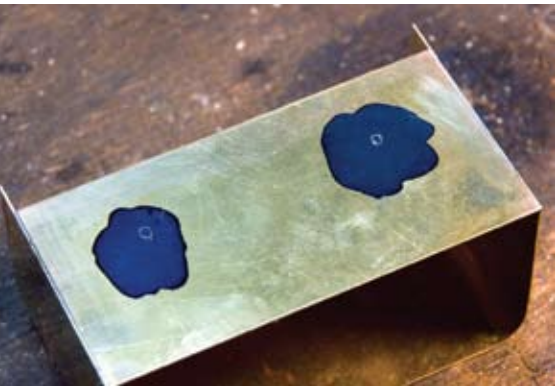


Photo 99

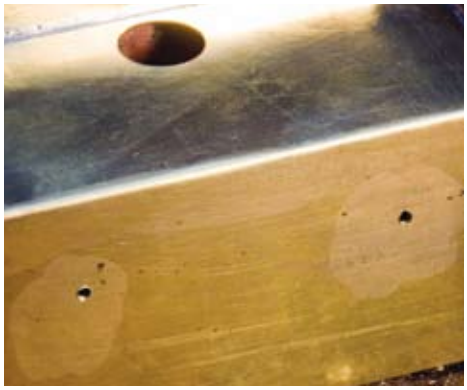


Photo 100

Photo 101

Photo 102

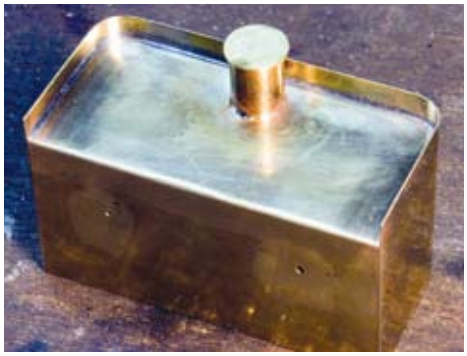


Photo 103

Photo 104

Photo 105

Photo 106

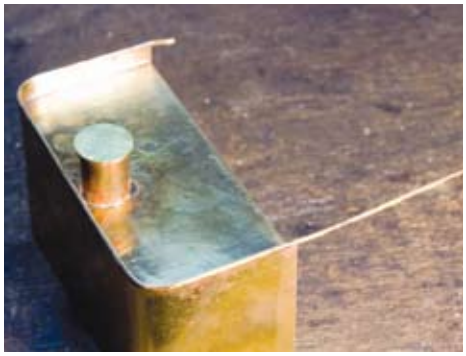


Photo 107

clips — something that won't suck up a lot of heat. Tack the half-round to the tank between the clips. Once it's securely fastened, remove the clips and solder the end of that side. Carefully bend the half-round around the corner and clip it in place along the back side (**Photo 106**).

Repeat the procedure, then finish up on the third side (**Photo 107**). Notice there's quite a bit of excess sticking out to the right. Clip that off and save it. We'll be using it later. File the end of the half-round flush with the tank and finish it off at a nice 45-degree angle (**Photo 108**). Do the same on the other end.

Make all of the coal-rail supports. These are straightforward pieces and need no explanation (**Photo 109**). For the L-shaped ones, tin the bottom of the short leg of the L-shape and the outside of the long leg. On the others, tin one side of each.

Referring to the drawing, determine your preferred placement for the coal-rail supports. The exact placement isn't critical, although the L-shaped ones along the front of the tank will need to clear the cab roof supports. The way it's drawn, there are four supports along the front and back and three on either side. The flat pieces are soldered to the inside edge of the wrapper, while the L-shaped ones are soldered to the top of the tank along the front edge. I marked the places on the top of the tank (**Photo 110**).

Again, if you have a resistance solderer, this is a good application for it. If not, a soldering iron should work just fine. Just go slowly and carefully. Let the work cool between each support so that it doesn't become too hot and start to come apart. The tank with all of the supports in place should look like **Photo 111**.

When you're ready to start adding the rails, start with the ones at the front. Put one along the top edges of the supports and another at the same level

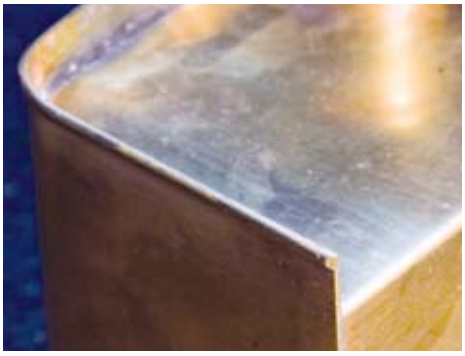


Photo 108

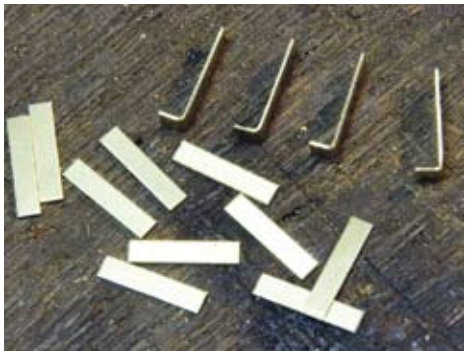
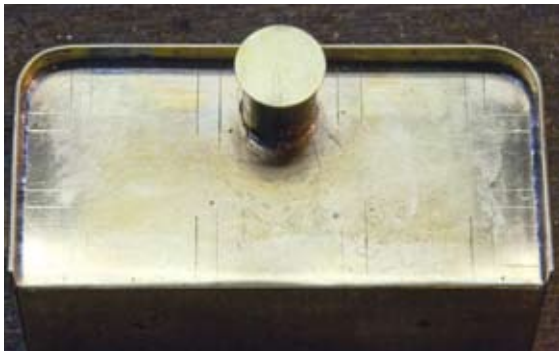


Photo 109



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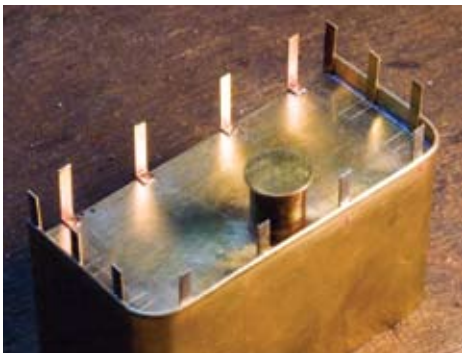

Photo 111

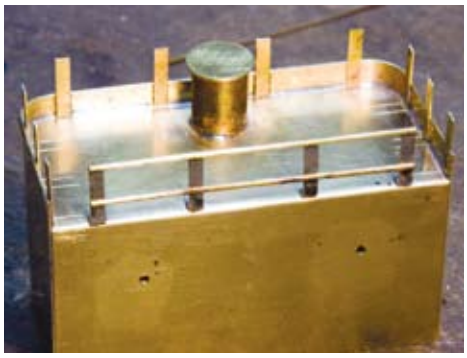

Photo 112

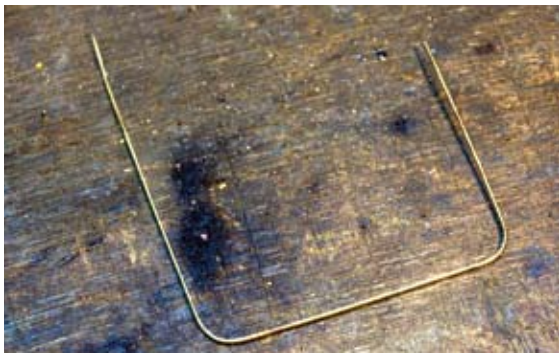

Photo 113

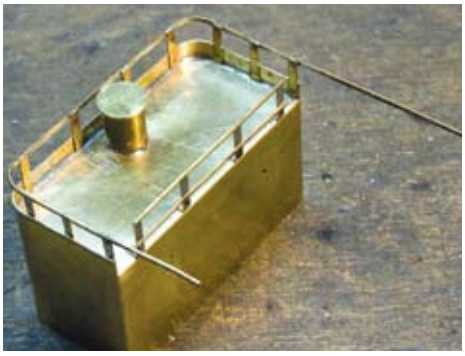

Photo 114

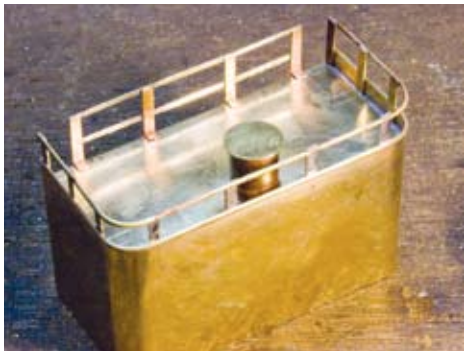

Photo 115

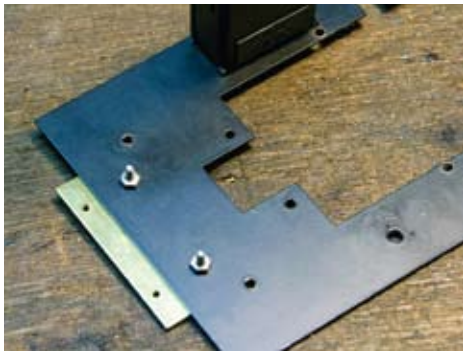

Photo 116

as the half-round around the top of the wrapper (**Photo 112**). For the rail around the outside, take a piece of half-round and wrap it around the outside of the tank to get the general shape (**Photo 113**).

Offer it up to the work and, by eyeball, massage it so that it fits just outside the supports and the curves match the corner curves of the tank. This will take a little trial and error but it isn't that difficult. Once you're there, clip it into place and begin soldering. **Photo 114** shows the rail soldered in place before trimming. The completed tank can be seen in **Photo 115**.

The deck extension

The last pieces to make are the deck extension and the splice plate. These should be made out of 0.040-inch-thick material. Make the splice plate first. When finished, use 2-56 screws and nuts through the larger holes to temporarily screw it to the underside of the deck, utilizing the holes to which the back of the cab is attached (**Photo 116**). Tape the deck extension to it and, using a No. 50 drill in a pin vise, mark the location of the holes on the deck extension (**Photo 117**).

Drill the No. 43 holes, then remove the splice plate from the deck and screw it to the underside of the deck extension. Any type of screws will do, as they'll be hidden when the engine is assembled. The finished pieces can be seen in **Photo 118**.

The final piece in the project is the rear bracket, which is simply a piece of 0.040-inch metal folded 90-degrees (**Photo 119**). Don't drill the hole yet. Mark the inside of the rear wall of the tank wrapper for the placement of the bracket (**Photo 120**), put some flux on the spot, and clip it into position (**Photo 121**). Then, with a small torch or a resistance solderer, solder the bracket into place (**Photo 122**).

Temporarily screw the cab side tanks to the deck. Screw the deck extension to the deck and cab, and

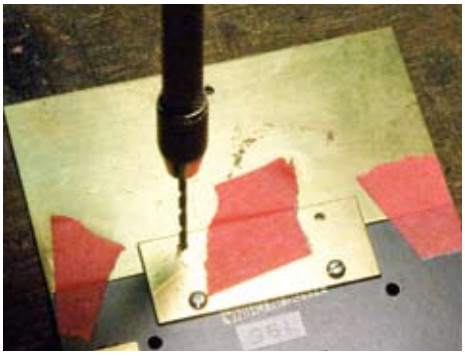

Photo 117

Photo 118

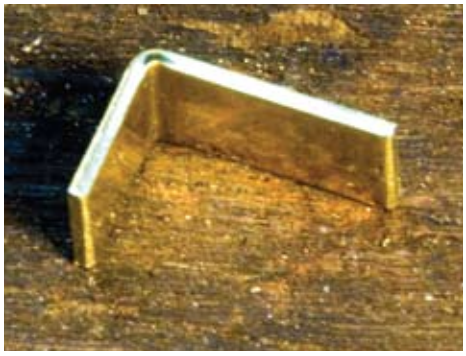

Photo 119

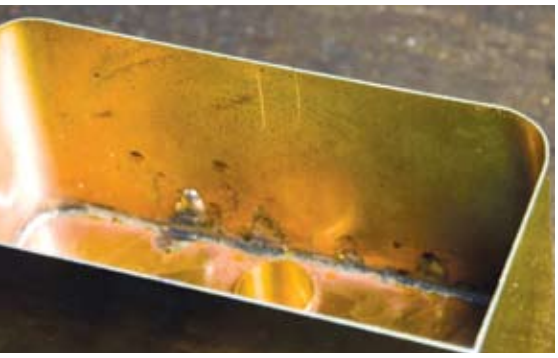

Photo 120

Photo 121

Photo 122

Photo 123

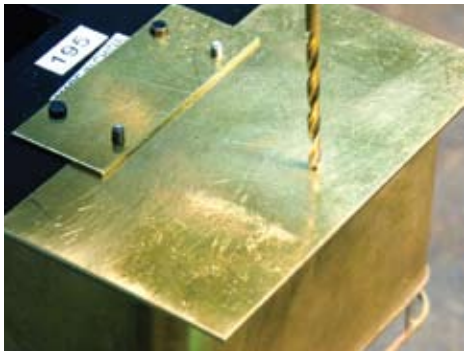

Photo 124

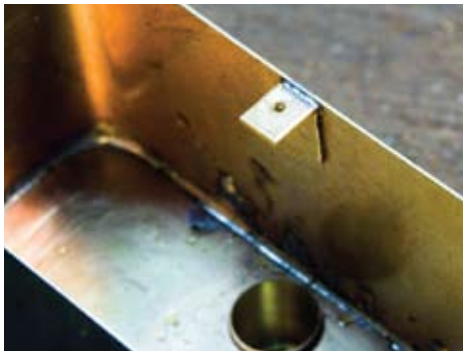

Photo 125

the new tank to the back of the cab with 2-56 screws (**Photo 123**). When you turn the assembly over, you should see the bottom of the rear bracket through the hole in the deck extension. Using your No. 43 drill, twist it a few times in the hole to mark its position (**Photo 124**). Then remove the tank and carefully drill a No. 50 hole at the mark, then tap it 2-56 (**Photo 125**). You're basically finished.

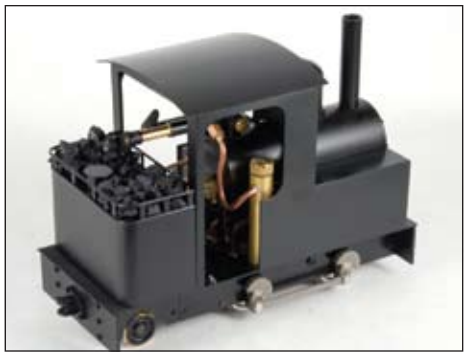

Photo 126

Reassemble everything just to make sure all is good. If there are any minor misalignments regarding screw placements, just adjust the holes through which the screws go with a round needle file. I also discovered I needed to square up the lower corners of the rear cab window so the coal rails would sit properly. When all is good, the only thing left to do is to paint your model.

Make sure all of the solder flux and oil is cleaned off. Give it a shot of primer — I like Rust-oleum. To ensure a good color match, I decided to repaint the cab and side tanks, too. I've found that Dupli-Color No. DA1603 Semi-Gloss Black is a pretty good match for the factory paint on this engine. After painting, put everything back together, and you're finished.

If you'd like to add a little more bling, how about a coal load in the new bunker? I made a solution of 50-percent white glue (Elmer's) and 50-percent water. I dumped my coal into the solution, then let it drain pretty well. Before it had a chance to dry, I filled the bunker with it. You can see the results in **Photo 126**.

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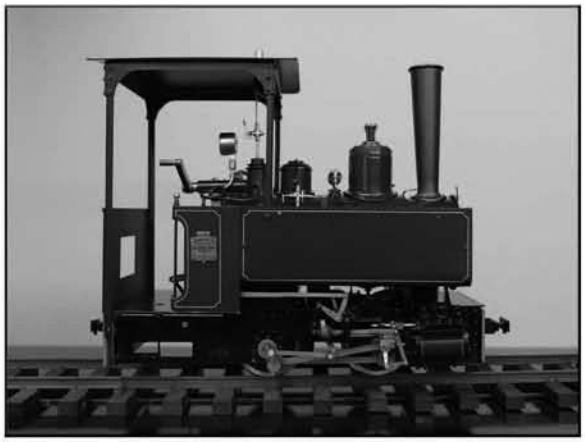

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Two-foot fan goes live steam in 1:19-scale by scratch building the Sandy River & Rangeley Lakes' 2-6-2 Prairie locomotive

Project 23

Text and photos by Ric Collins

I have been a two-foot narrow gauge railroad enthusiast ever since reading "The Maine Two-Footers" by Linwood Moody, published in 1959.

Over time I became interested in many of the two-foot narrow gauge railways around the world. The first two-foot narrow gauge railroads in the United States were based on the successful Ffestiniog Railway in Wales, so naturally I had to see and experience the "granddaddy" of all two-footers – and did just that during two trips to Wales in 1984 and 1987.

SR&RL prototype. *Completed engine on author's Lincoln, Calif. pike.*

For years I had watched videos and read books about the Maine two-footers, and the Sandy River & Rangeley Lakes Railroad always held a special interest for me. In 1992 my wife and I vacationed in Maine to see what remained of the two-footers, and that included a stop at Edaville, Mass. While in Franklin County, Maine, we spent a great deal of time in Phillips at the local historical society, the Sandy River Railroad restoration park and the old rail yard where the remains of the engine house and depot still stood. We also hiked the old SR&RL grades and stayed at the Rangeley Tavern in Rangeley — it was once owned by the SR&RL.

This article appeared in a slightly different form in the newsletter of the 16mm Association of Narrow Gauge Modelers in the United Kingdom.

I modeled the Sandy River in On2 scale for more than 30 years — until 2003 — but I initially became interested in the larger scales during the early 1990s when LGB produced a 45mm gauge Sandy River & Rangeley Lakes electric 0-4-4T locomotive. I acquired one along with several pieces of rolling stock to operate indoors. G-gauge electric locos were interesting, but my enthusiasm perked up when I watched a friend run his alcohol-fired live steam Shay on 45mm-gauge track.

By 1995, I became acquainted with a company in the United States selling scale live-steam models of Maine two-foot gauge locomotives manufactured in Australia by Argyle Locomotive Works. At the time, Argyle offered a couple of Sandy River two-foot gauge, live steam locos to operate on 32mm gauge track, and I quickly decided that was the direction I had to go. My first live-steam purchase was the custom-built Argyle Sandy River Mogul named "Old

Builder's photo. *Baldwin completed SR&RL No. 23 in November 1913.*

Star," delivered in 1996 to our brand new garden railroad, the Mount Greta Railway. Over the next 10 years, the MGR commissioned Argyle to custom-build three additional engines for the railway, a 2-6-2 Prairie, a 2-4-4T Forney and a 2-8-2 Mikado.

For some time, I had thought about the possibility of scratch building a 1:19 scale (also known as 16mm scale in metric countries) live-steam locomotive; and by 2006 I had made the decision that I wanted to build Sandy River & Rangeley Lakes Prairie Locomotive No. 23, the largest two-foot gauge locomotive ever constructed for service in North America. No. 23 had always been one of my favorite two-foot locomotives, and in fact I had scratch-built this same locomotive in On2 scale back in the early 1970s.

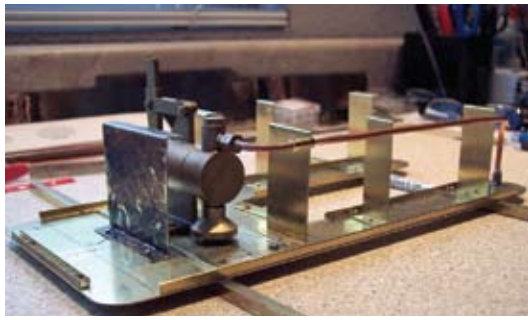
The prototype SR&RL No. 23 was the brainchild of the chief engineer and superintendent of motive power of the Maine Central Railroad, which had taken over control of the SR&RL from local ownership in 1908. The Maine Central (reporting mark: MEC) had big plans for the Sandy River, which was at the time a feeder line to its own standard-gauge railroad interchange yard at Farmington, Maine.

The MEC wanted to take maximum advantage of the increased flow of pulpwood and lumber products funneling down the Sandy River line to Farmington. To do this they needed to upgrade the Sandy River's aging fleet of locomotives.

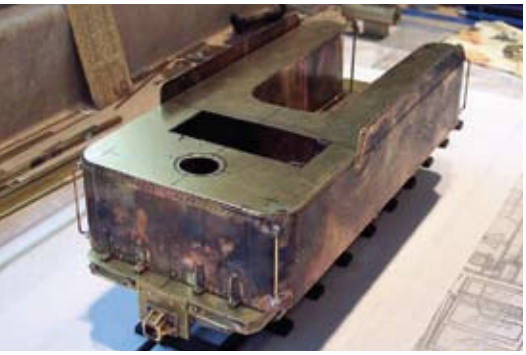
The original MEC plan called for eight new heavy-freight 2-6-2 engines. The MEC issued "Specification No. 151 for a Prairie-Type Freight Locomotive," with a total weight of 63,000 pounds; this was to be the No. 23 class. Sometime later when the new specifications were sent to the Baldwin Locomotive Works in Philadelphia, the proposal was reduced to three of the No. 23 class locomotives with road Nos. 23, 24 and 25.

Tender. *Wheels assembled.*

Tender. *Frame attached to wheels.*



Tender. *Water pump, piping.*



Tender. *Sides, top added.*

Tender. *More parts.*

Tender. *Completed part.*

While Baldwin was preparing the working drawings for these engines, the MEC again reduced the order, this time to one locomotive, designated as Baldwin's Builder Class 10-20 1/4 D-15, Builder's No. 40733, and marked as SR&RL No. 23. The No. 23 was finally assembled in October 1913 and delivered to the SR&RL in November 1913 for $7625.

Part of my decision to build this locomotive was based on my having a copy of the original MEC and Baldwin specifications plus a complete set of the Baldwin Locomotive Works (BLW) drawings. I believe that if you are going to model a prototype piece of equipment, you must have accurate drawings from which to work.

Some of the No. 23 drawings in my collection are BLW originals and some are re-drawings of original BLW drawings. The re-drawings were published in a 1977 booklet, the "Two-Foot Cyclopedia," Volume 2, by William H. Jensen Jr. Some of the original BLW drawings I have were provided to me by Robert Schlechter and Edward Bond. The rest were purchased from the BLW collection at the Everett DeGolyer Library in Dallas, Texas.

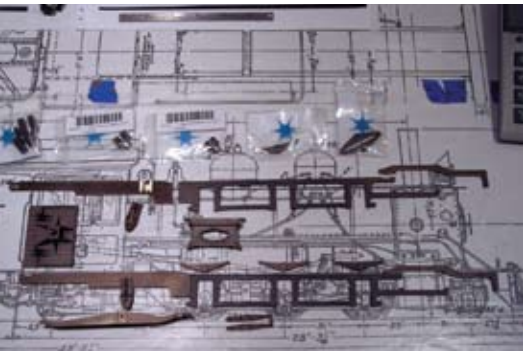
I studied the basic construction materials and methods used by other live-steam model builders and developed a working set of specifications for the new loco, but nothing else happened for several years.

The construction of No. 23 did not start until after I had retired from working full time in 2012. Only then did I have the time necessary to devote to the project. The 23 project started in earnest during the summer of 2014. While attending the National Summer Steamup in Sacramento that year I discussed the project with Rob Lenicheck, an experienced live-steam narrow gauge scratch builder (see pages 21-28 and 54-58). Rob's latest project at that time was a beautiful Denver & Rio Grande Western C-25 locomotive, and it was the inspiration I needed to get Project 23 going.

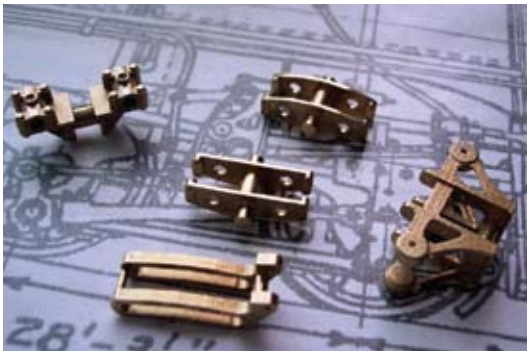
The first priority was to equip and set up my shop with the machine tools needed to handle the work. The last time I scratch built locomotives I still modeled in On2 and I knew my old equipment would not be heavy enough for building in 1:19- or 5/8-inch-scale. I began with a new steel work bench; a mini metal cutting band saw and a mini-vertical mill/drill machine. We live in a retirement community, so the garage/shop space is limited and this equipment filled the new work bench with only a small space left over for a lathe. I decided to utilize my Unimat SL1000 for the light-duty machining needed and rely on the new mill for the heavy work.

The tender

I started off first building the tender before the engine, as I needed to gain experience using the new machine tools and the tender had fewer and less critical parts to machine than the engine. After securing a supply of steel and brass stock, I started scratch building the parts for the tender. The truck parts were machined from brass stock to match the BLW drawings. A California company, Sierra Valley Enterprises, provided the correct size of 32mm-gauge, fine scale wheel sets; Ozark Miniatures of Cedar City,



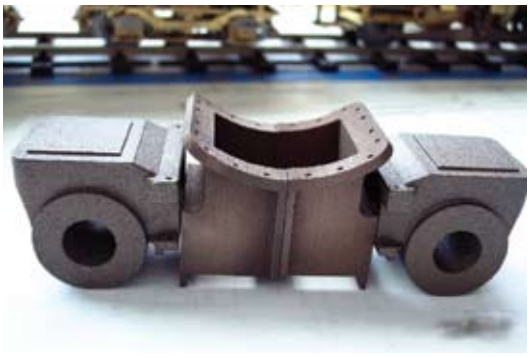
Chassis. *Frames and parts.*



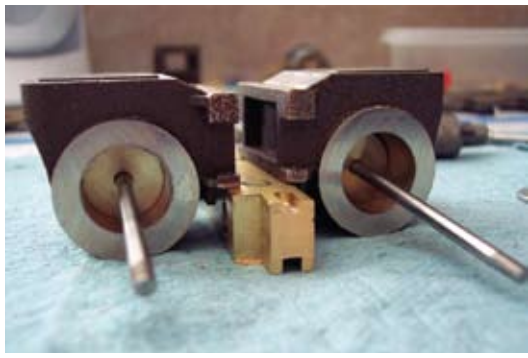
Chassis. *3-D printed parts.*

Chassis. *More parts.*

Chassis. *Smoke stack, others.*

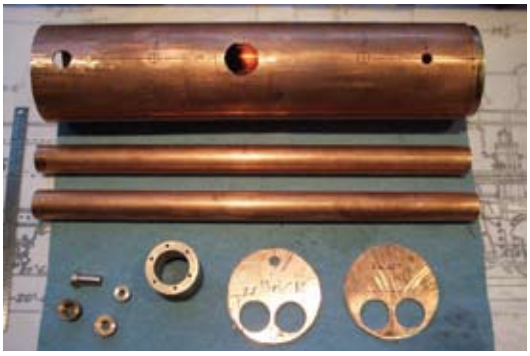


Chassis. *Printed cylinders.*



Chassis. *Pistons added.*

Utah, provided the white metal brake shoes; Trackside Details of Pinedale, Calif., provided the brake hose fittings; The Train Department of Hazlet, N.J., provided the gas control valve and quick disconnects, and Ron King, a good friend and expert woodworker from nearby Nevada City, provided the solid maple brake beams.



Chassis. *Copper parts for the boiler.*

The tank was cut out of 0.020-inch sheet brass and a NWSL Sensi-Press was used to emboss the rivet details. The tank wrapper was made in four sections to make it easier to add the rivet detail and the seams were butt joined with silver solder. Ron King provided a wood mold of the tender tank to use in forming the wrapper after the soldering. The gas tank was scratch built using copper tubing and flat plate silver soldered together and fitted into the rear of the tender tank. A spare hand-operated water pump from an Accucraft Shay was provided by another local garden railroad friend, Mike Falkenstein.

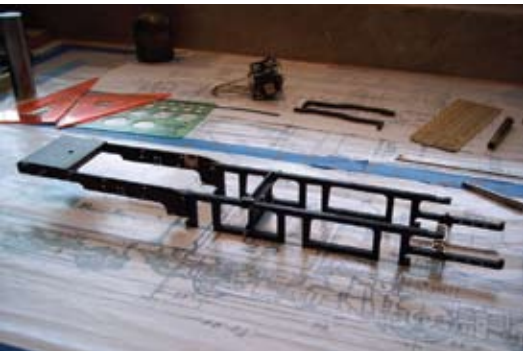
The engine

My initial plan was to have the major flat pieces such as the chassis frames water-jet or laser cut from mild steel plate. However, after working out the computer-assisted design (CAD) needed with my friend and CAD expert Rich Dunn, we made the decision to design and order a couple of test parts using the three-dimensional CAD and metal printing services provided by Shapeways Inc. of Long Island City, N.Y. (http://www.shapeways.com). Rich used the BLW drawings and my sketches to produce new 3-D CAD drawings starting with the frame parts needed to build the chassis.

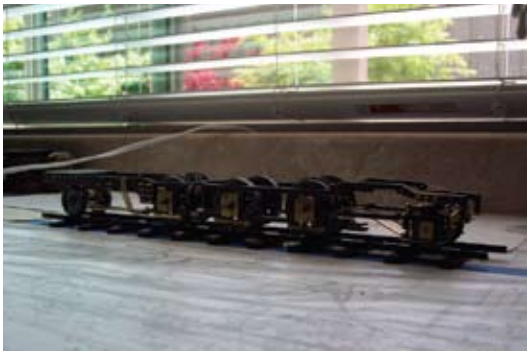
We were impressed with the quality of the 3-D-printed steel and brass parts and the speed at which Shapeways was able to deliver the parts. As the parts arrived from Shapeways, I checked them for accuracy and fit and we found the printed test parts were undersized by about one percent. Therefore a one-percent shrink factor was added to the 3-D drawings. The additional shrink allowance corrected the problem.

After inspection, the parts were machined, drilled and cleaned up as needed for assembly. I soon discovered that ordinary high-speed steel tool bits would not cut through the surface of the matte bronze-steel parts produced by Shapeways. It was necessary to use coated solid carbide tool bits made for machining stainless steel.

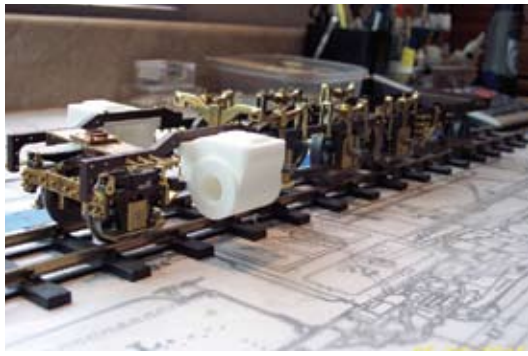
After this change, the machining progressed without problems. Ordinary high-speed steel (HSS) taps and dies in the smaller USA sizes up to 0-80 were of no use on the matte bronze-steel, but larger-size HSS and carbide taps would do the job if you were



Chassis. *First assembly step.*

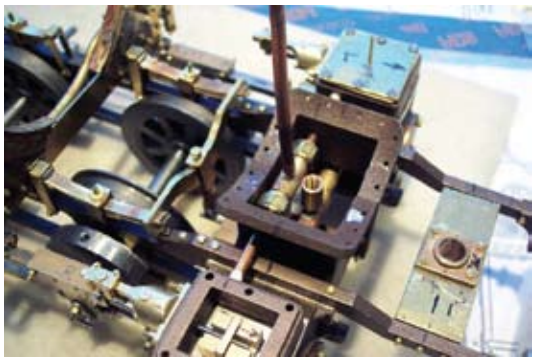


Chassis. *Next assembly step.*

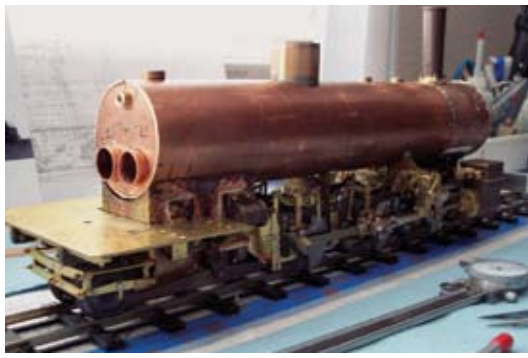


Chassis. *Adding cylinders.*

Chassis. *Plumbing, front end.*



Chassis. *Readying for the boiler.*



Chassis. *Adding the boiler.*

careful to go slow and use a tap lubricant. I drilled the frame assembly holes clear through and used machine screws and nuts for fasteners.

The main decision for using the matte bronze-steel material was the overall cost of the parts. The steel parts were about 50 percent of the cost of the same parts made in raw brass, although the detail was much better with brass. I had intended to purchase the cylinders in brass based on the ease of machining, and I was not sure if the bronze-steel cylinder bores would clean up well enough to hold steam pressure. However the cost of the parts in brass convinced me to try using the bronze-steel instead.

Chassis. *Smoke box door, smoke stack.*

I will admit that boring the cylinders and drilling the steam and exhaust ports was indeed a challenge, but in the end, I was satisfied with the smoothness of the bores and I cannot detect a significant difference in the operational quality of the two materials.

I prepared a specification for the wheels and contracted Walsall Model Industries, who did an excellent job providing the loco drive and pony truck wheels, counterweights and axles. Three-D-printed parts were produced for the pony-truck pedestals and the center pin support, and all other pony-truck parts were scratch built to match the BLW drawings. The driver axle boxes, driver springs and staples were scratch built from brass stock. The chassis has a fully operational equalized suspension system, but also has coil springs installed on the top side of all axle boxes for added adhesion effect.

Fabricating the boiler was a new experience since I had never built a small-scale live steam boiler before. I followed the design guide lines published by Martin Evans in his book "Model Locomotive Boilers" (Model & Allied Publications Ltd., 1969) and Brian Wilson's book "Steam Trains in your Garden" (Camden Miniature Steam Services, second edition, 2015).

I purchased a Sievert propane torch set to provide the heat required for silver-soldering the large boiler. The boiler shell and smoke box is 0.065-inch wall by 2.50-inch diameter C101 seamless copper tube with two 0.035-inch wall by 0.75-inch diameter C101 seamless copper burner flue tubes. The end tube plates were cut from 0.08-inch thick C110 copper sheet.

The boiler bushings were cut, turned and threaded from 0.50-inch C510 bronze round stock. The steam dome was made from 1¼-inch C510 bronze round stock with a high-pressure stainless steam line routed inside the boiler from the top of the steam dome to the steam regulator, through a bushing on the back head. The dome cover is a 3-D-printed bronze-steel part.

The top mounted sand dome is designed for use as

Last adjustments. *Almost done.*

In brass. *Finished locomotive just needs paint to become completed.*

Roll out. *Newly finished No. 23 on first steaming.*

Collaborators. *Left to right, Bob Schlechter (BLW drawings), Rich Dunn (3-D CAD), the author (machinist/builder), Ron King (wood builder).*

the hydrostatic lubricator reservoir. A stainless-steel steam line riser tube with orifice originates in the sand dome, and transfers the steam oil through the stainless tube inside the boiler through a bushing on the front tube sheet. There it connects inside the smoke box to the stainless steel superheated steam line coming from the steam regulator to the cylinder steam chests. The sand dome lid is a 3-D-printed brass part threaded on the inside and fitted with an O-ring to seal the oil in and serve as the lubricator cap.

The steam chests, chest covers and smoke box saddle are bronze-steel printed parts. The valve guide and yoke, slide valves and valve rods are scratch made. The valve rod packing glands, valve rod guides, expansion links, reverse shaft and link bearings are 3-D-printed brass parts. The main connecting rods, side connecting rods, reverse link rods, eccentric rod and crank and the cab reverse lever are 3-D-printed stainless steel parts. All rod ends have brass bushings installed.

Some of the small loco fittings such as the headlight, whistle, cut-lever supports and brake-line fittings are

No. 23 under steam. *The author with his engine at the Summer Steamup in July. Photo by Carla Brand Breitner.*

castings provided by Trackside Details. The smoke box number plate and builders plates were made in the United Kingdom by MDC Plates. The Train Department provided the twin gas burners and jets made by Regner as well as the two WeeBee safety relief valves. The air compressor is 3-D-printed using bronze-steel and the air governor is a 3-D-printed brass part. The side air drums are from brass tubing and the air drum/running board supports are 3-D-printed in brass.

The loco cab, pilot and tender tool boxes were scratch built using birch wood sheets, and the cab roof is brass lined inside with birch wood and with a working wood-ventilator hatch. Many individual parts on the loco and the tender were scratch built using steel and brass stock because 3-D printing would have been impractical or too costly for minor parts.

The No. 23 loco was assembled and ready for steam trials by December 2015. Final completion and road operation took place during February and March 2016. You can see most of the parts designed by 3-D Printing for the No. 23 Project online at http://www.shapeways.com/shops/mglocoshop.

Changing an Accucraft C-16 from butane to solid fuel

COAL conversion

Text, photos and illustrations by Rob Lenicheck

OK, the boiler is finished, right? And is pressure tested? Time to pat yourself on the back for accomplishing a really tough job. In this article we will add the ash pan and grate, and seal up the smoke box.

Ash pan and grate

Because of its location overlapping the rear-most driver axle, the ash pan must be held permanently in place by the holes in the frame we drilled and tapped in Part I. (You did do this, right?!?) Thus, in order to clean out the ashes we need to provide access holes at the bottom of the ash pan. Each hole is covered over by a door which slides out for cleaning. The ash pan and doors are made out of 0.032-inch stainless sheet. Be sure that the silver solder you use to put this together is compatible with soldering stainless. Please refer to **Figure 21** for dimensions.

I fabricated the entire bottom pan of the ash pan from one sheet, bending the sheet as needed. If you want to do that I recommend making the sides first, and then using them as a pattern for your folds. (You'll get to challenge yourself by having to calculate the length of the piece needed since I didn't include a drawing for that. Cut it long, make your bends starting around the axle hump, make the end bends and then cut off the excess.)

Despite what the drawing suggests, before you drill the holes for attaching the ash pan to the frame, make up the ash pan retainer pieces and attach them to the frame. Then place the ash pan in the frame but temporarily put a 1/16-inch spacer shim on the top of the rear axle. This piece helps assure that the ash pan does not rest on, or interfere with, the axle. Make sure that the ash pan is level and mark the hole locations on the ash pan sides. Once your holes are drilled and tapped you can remove the shim on top of the axle.

The complete ash pan, in place, looks like **Photo 22**. (Please pardon the grate in the picture – this was "rev 1" which did not work so well when it came to cleaning out the ashes.)

Draw bar and pin

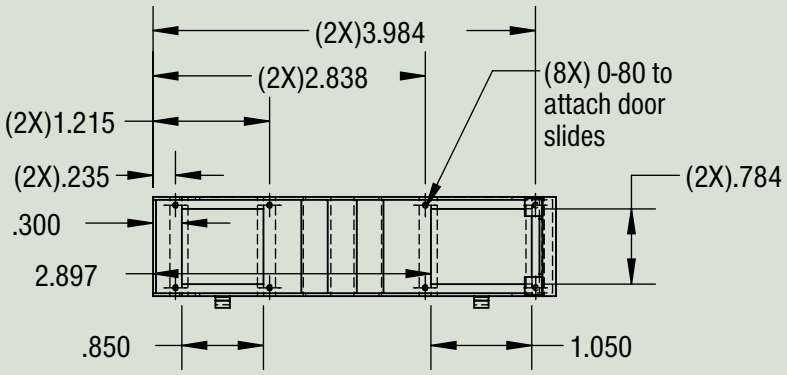
Since the draw bar needs to be removable in order to get the grate out, we need to make up a new one and figure out

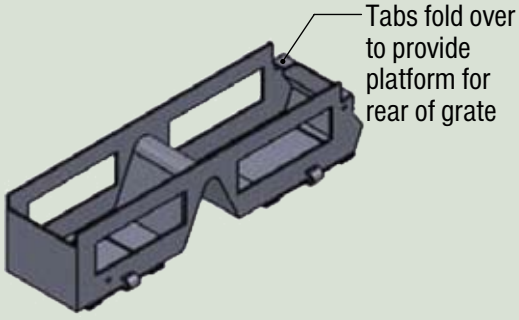
Coal conversion of a C-16

Rob Lenicheck's Accucraft C-16 ran nicely once he got it "tweaked." So nicely, in fact, that it grew boring. What to do? Rob, a committed coal-burner, decided that he would convert the engine to "the dark side." Here's how he did it:

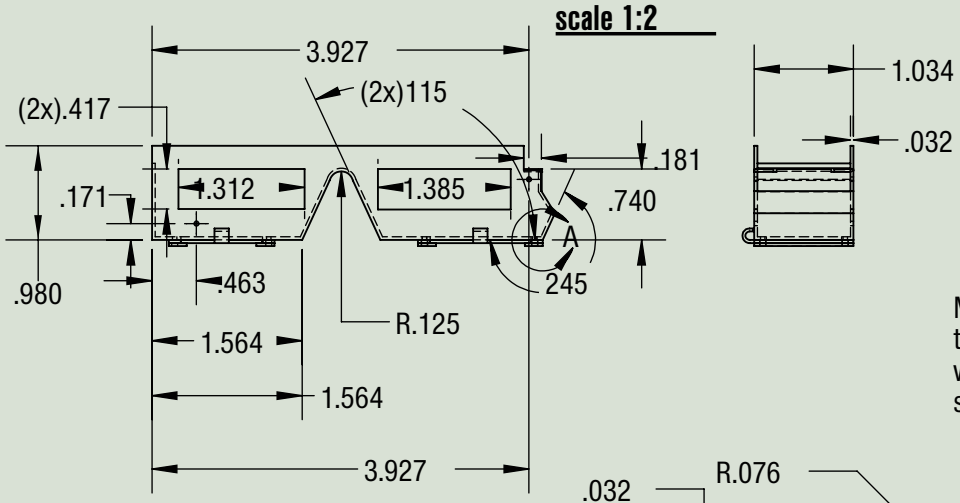
- **Part I:** Designing the valve gear, disassembly, modifying the frame.
- **Part II:** Starting the boiler.
- **Part III:** Finishing the boiler, pressure testing (in this issue; see Pages 21-28).
- ➲ **Part IV:** Smoke box, ash pan and grate.
- **Part V:** Steam manifold, fittings, blast pipe.
- **Part VI:** Axle pump & bypass plumbing, water glass, wrapping it up.

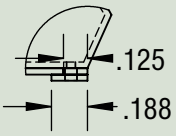
Figure 21 – Ash pan and grate





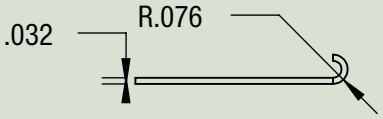
scale 1:2

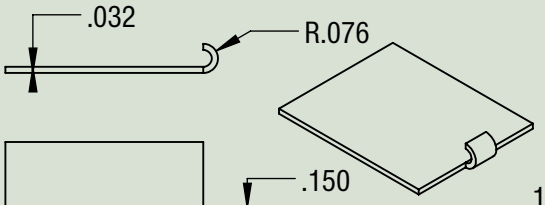




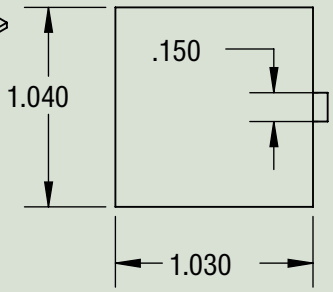
DETAIL A
SCALE 1 : 1

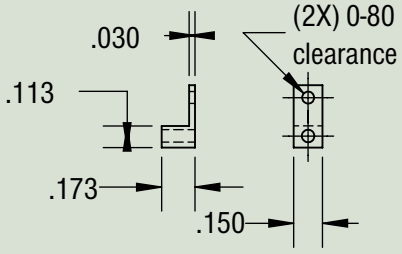
Make four pieces of each to full width and attach with 0-80 screws for door slides.





Scale 1:1

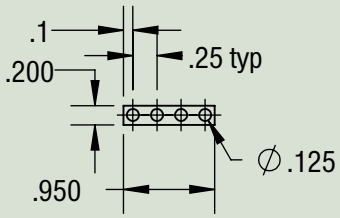


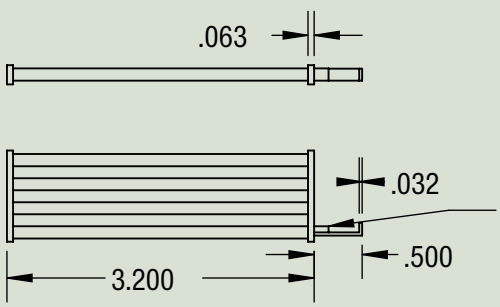


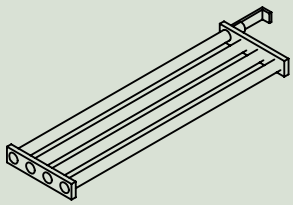
Ash pan retainer make 4X from brass

Front ash pan door

Rear ash pan door







Make bar half round for attaching removal bar

Grate: make from stainless steel

Photo 22

Photo 23

Photo 24

Photo 25

how to retain it. In order to use the new pin, the current threaded hole for the old pin must be drilled out. Size the hole as close to the pin size as possible so as to minimize the slop.

I found that I needed a bit more room between the back of the cab and the tender for getting the coal into the fire box. The draw bar I have included in **Figure 22** is a tad longer to help with this.

In order to keep the draw bar in place it's easy to use a cotter pin and some kind of spacer. In the picture I have a spring, however, the spring is not really needed. A piece of round tubing works just as well. What we're trying to accomplish is getting the draw bar to mate with the tender pin at a height which works: like the three bears, not too high nor too low but just right. **Photo 23** shows the draw bar I fabricated.

Smoke box

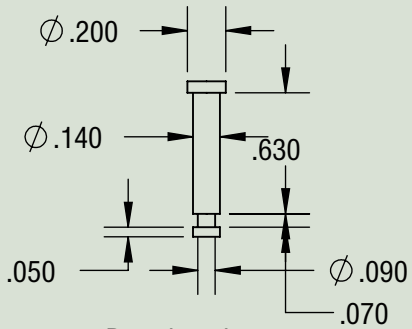
The main difference in the smoke box between a gas-fired engine and one which fires on coal is that the latter must be sealed so that the only air flow coming into it is from the tubes through the boiler. It must be this way in order to maximize the flow through the fire box, so that the coal stays lit. (Our little coal engines depend on a good and constant flow of air from below the coal to keep it burning.) Therefore, some changes need to be made in the smoke box to accomplish this.

If you have not removed the smoke box now is the time. You must remove the stack to get to the two M3 screws at the bottom which attach to the steam chest. (The stack nut unscrews from the bottom – grab it with a pair of pliers.) It's up to you to decide whether or not to keep the layer of insulation inside the smoke box. It's really not necessary and I took it out of my engine without causing any adverse effects. Beyond that, the first thing I would suggest doing is to silver solder the fire box door closed, since you will not ever need to open it. In order to clean the smoke box flues and tube simply take the entire smoke box front off. This, of course, means that the fit between the front and the smoke box itself must be a fairly tight slip fit. My engine was already this way so it works well. Your door may be different, but mine can be seen in **Photo 24**.

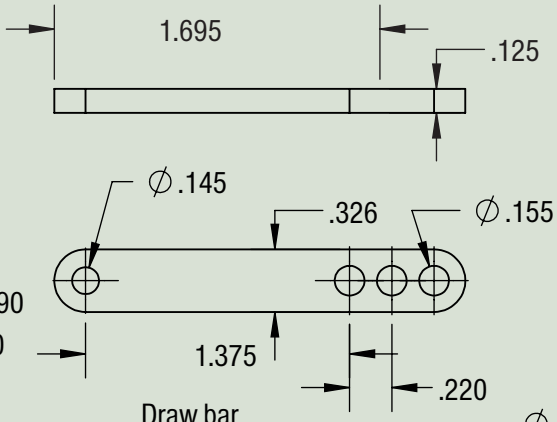
If the smoke box front does not fit tightly you may have to add a ring of material and then turn it down in the lathe. But defer this work until we finish with the rest of the changes in the smoke box.

On my engine, the smoke box outer diameter was not a one-piece tube. Yours will probably be

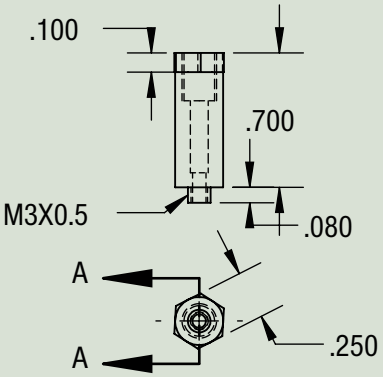
Figure 22 – miscellaneous parts

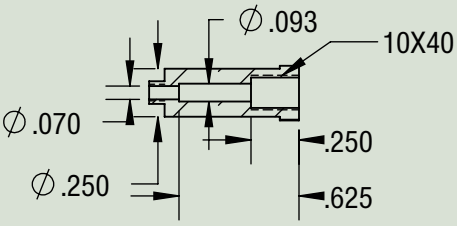


Draw bar pin;
make from
stainless steel



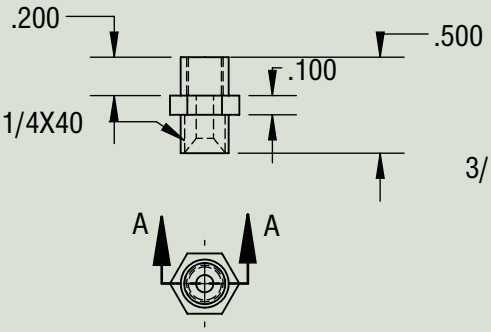
Draw bar
make from brass

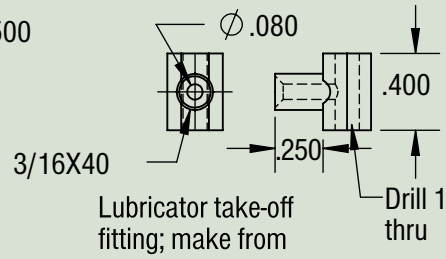




SECTION A-A
SCALE 1 : 1

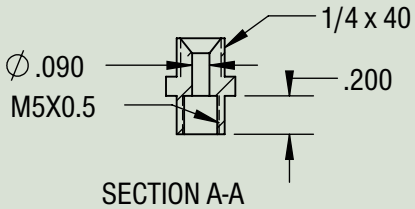
Exhaust extension
make from stainless steel;
place a dab of silicon
thread sealer on M3
threads prior to inserting





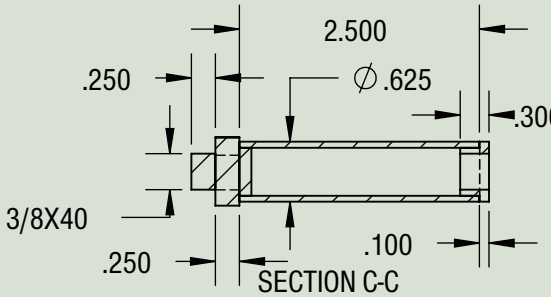
Lubricator take-off
fitting; make from
1/4" hex brass

Drill 1/8"
thru

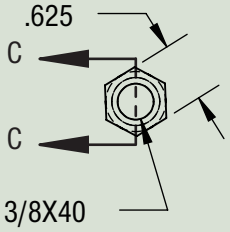


SECTION A-A
SCALE 1 : 1

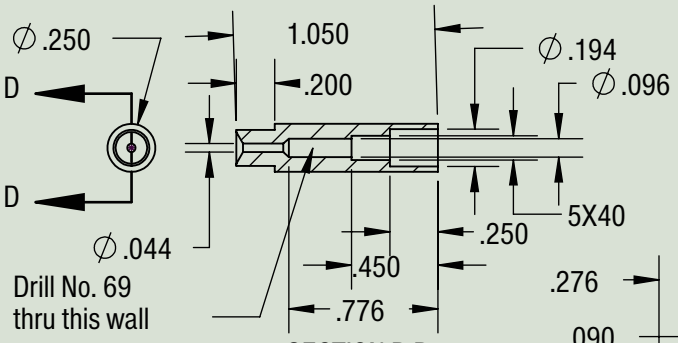
Steam line extension
make from brass



SECTION C-C
SCALE 1 : 2



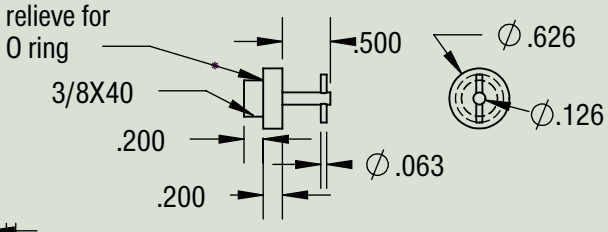
Lubricator body
make from copper
with brass end caps



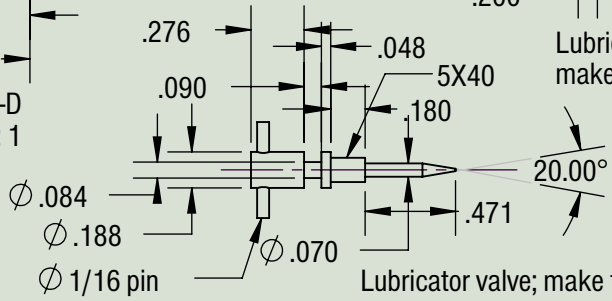
Drill No. 69
thru this wall

SECTION D-D
SCALE 1 : 1

Lubricator valve body
make from brass



Lubricator top cap
make from brass



Lubricator valve; make from 303 stainless steel

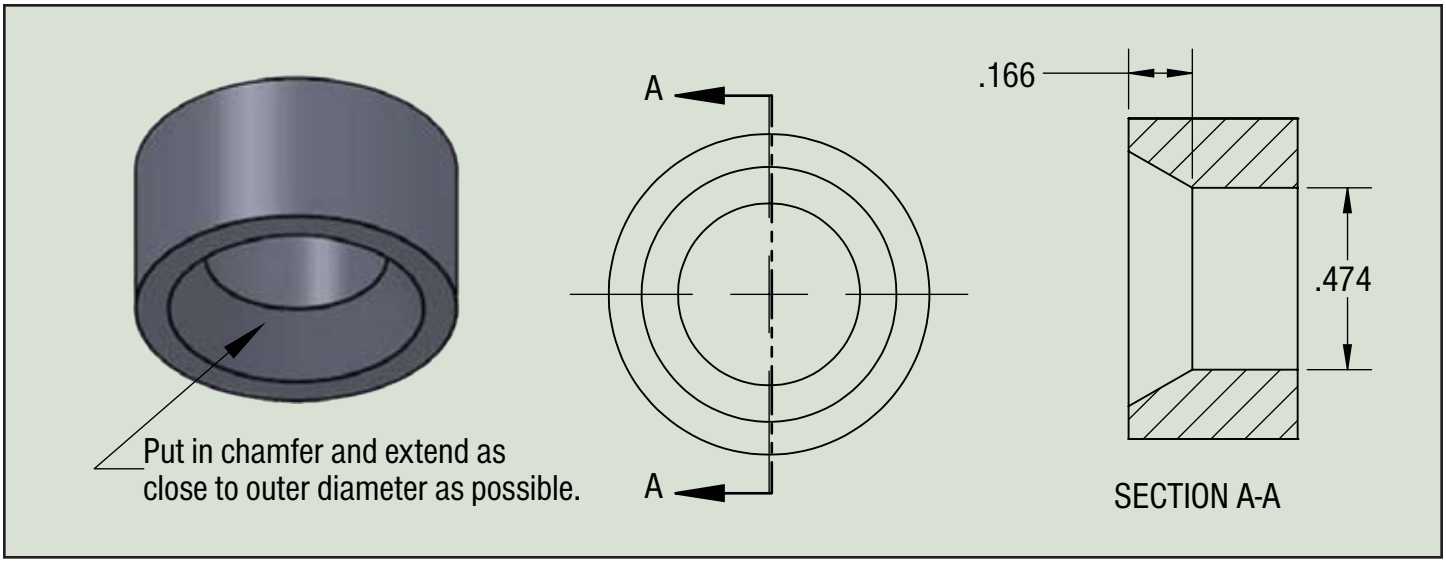


Figure 23

Photo 26

the same. To help with the seal we need to solder the seam to make it a tube. Make up a small piece of brass and give it a slight bend to match the inner diameter of the smoke box and silver solder it to the inside. Be careful doing this: you can see in **Photo 25** that I used too much heat and the brass evaporated as I was soldering. Luckily, it doesn't show.

I would suggest that you perform this solder operation while the smoke box is attached to the boiler sleeve, as in the picture. As a soldering aid, run a length of wire around the outside and twist it closed. This assures you will get a good fit and that the two edges of the butt joint in the smoke box will be joined firmly together.

Accucraft has made it challenging for us to accomplish two things:

- To get the blast pipe centered within the cylinder of the stack.
- To get a good seal at the bottom of the blast pipe to maximize the draft available.

Luckily, there are things we can do to find a workable solution.

First, we need to make extensions for the steam pipe and the blast pipe so that the bottom of the smoke box can be sealed. These parts are labeled "exhaust extension" and "steam line extension" on **Figure 22**. Note that the exhaust extension is made from stainless. This is necessary for strength because of the minimal number of M3 threads at the bottom. And pay particular attention to the length of these threads – making the threads too long will cut off the exhaust available for the draft. Before permanently threading in this part, place small amount of silicon sealer on the M3 threads at the bottom. (I use Loctite 565 PTFE thread sealant.)

A custom piece of brass needs to be made to fit on the bottom of the smoke box, covering the gaping hole surrounding the fittings you just made. I do not have a print for this because each engine may be different. The best way to fit this piece up is to measure the center-to-center distance between the fittings, and drill those holes into the brass. Then do your best to locate and drill the two holes which attach the smoke box to the saddle. The bottom of the smoke box then looks like **Photo 26**.

The final touch to the smoke box involves improving the draft potential for the blast pipe. We need to put a large chamfer into the underside of the round, coarsely-threaded "nut" which secures the stack to the smoke box: See **Figure 23**.

The 0.474-inch-diameter and the 0.166-inch-dimension are critical for the blast pipe length. These dimensions are what my stack base measures. If yours differs from that then you will have to alter your blast pipe length to conform to the 1:3 guideline, which I'll talk about in a subsequent part. That's it for now.

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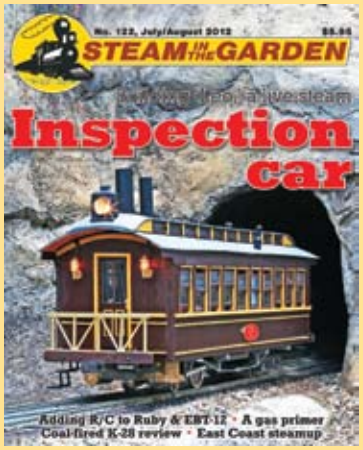

Additionally, the magazine reviews a wide variety of new products, including locomotives from Accucraft Trains, Aster Hobby Inc., Märklin Bros. & Co., Regner Steam and Railway Engineering, Roundhouse Engineering Co. and Wuhu Brand Arts & Crafts Co. Each review gives you not only the opinion of a seasoned steamer, but also specifics about the prototype on which the model is built and details on the weight, size and gauge of the model.

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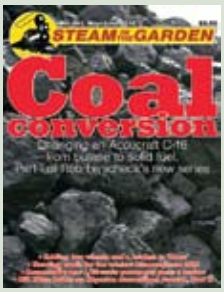

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Coal conversion: Changing an Accucraft C-16 from butane to solid fuel • 'Dora' wheelie • Streamlined Garrett: 1:32-scale scratch built steamer. Part II of three • Pleasing Pullmans • Locomotive diversity: International Small Scale Steamup in Diamondhead. • Latest waybill: Aster, Accucraft, Regner.

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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. 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.

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Vol. 25, No. 2; Issue 138; March/April 2015
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1:32-scale motorized 'action' cars need special electric rail; change them over to battery, radio

R/C DUMP CARS

Text and photos by Dave Frediani

About two years ago, I bought a used 1:32-scale operating side dump car made by MTH Rail King. The car was originally activated by an accessory track section and a switch box that would allow the dump car to raise and tilt to one side, shake to be sure all the contents were dumped, and then return to its resting position.

I wanted to be able to activate the car on any part of my railroad, not just where the activated accessory track section was, as well as any railroad or steamup that I would visit. While looking for a way to accomplish this I started working on the car, making small changes, like changing the hook-and-loop couplers to link-and-pin couplers, removing the railroad signage and weathering the car to make it fit in with my other small 1.20.3 rolling stock.

After three or four weeks, a friend of mine, John Lloyd, found just what I needed to convert the car to remote control. This was a small, wireless 12-volt, single-channel controller that works well using just one nine-volt battery. The unit can be had from a company called "All Electronics" in Los Angeles or online at Amazon.com under another brand. Both suppliers use the same part number for the controller, No. RM01. The only other parts needed are one nine-volt battery and a small on/off toggle switch, for a total cost of about $27. The unit is fairly easy to install.

1. Remove the two screws that hold the slide shoes (or pickups) that sit on the bottom of each truck. Then cut each connecting wire as close to the pickups as possible.

2. Remove the two truck assemblies.

3. Remove the four screws that hold the top cover of the motor compartment that sits just under the trucks. This will expose the motor. To the right of the motor block is a space with a small circuit board mounted by two screws. Remove the screws from the circuit board and cut all the wires as close to the circuit board as possible, including the wires from the slide shoes (pickups) so that you'll be able to solder and connect the wires to the motor and the new remote control unit.

4. With the circuit board now removed you will find two standoffs that were used to hold the circuit board in place. I used a rotary tool (Dremel) for this step. The standoffs must be cut flush with the bottom of the motor housing, so that the nine-volt battery will sit flat on the bottom of the housing.

5. Using the rotary tool, cut two half-round openings about three-eighth inch on the rear wall of the newly open area, to allow clearance of the new wiring that will be installed later.

6. Drill a one-fourth-inch hole on the side of the motor compartment, opposite the direction that the car dumps., to mount the toggle switch. Make sure that the location of the hole will not interfere with the battery, after the switch is installed.

7. Remove the cover from the new controller that will now sit on top of the nine-volt battery.

8. Remember to pull the wires that were cut (**Step 3**) up from the slide shoes (or pickups) then cut them

Open: *The MTH dump car with the body extended.*

Exposed: *Original electronics seen with top cover off.*

Change: *Trucks off, new electronics, battery.*

Fitting: *The new R/C receiver sits inside the car's frame.*

Almost finished: *Note on-off switch on car frame.*

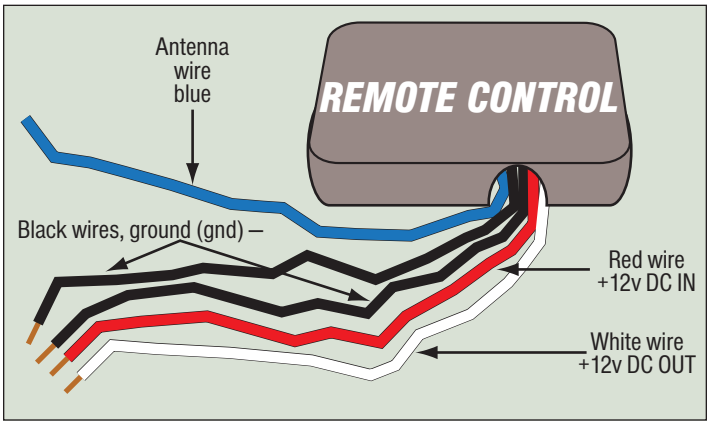


Diagram: *Identifying the wire colors.*

from the old circuit board that was removed.

9. The new controller has five wires. One red positive wire (marked 12v in), one white positive wire (marked 12v out), two black negative wires (marked "gnd"), and one blue antenna wire (marked "ant").

10. Connect the white positive wire from the controller to the black positive wire with a white stripe coming from the motor. Next connect one of the black negative wires from the controller to the black negative wire coming from the motor. Next connect the red positive wire from the controller to the positive terminal on the toggle switch. Then the remaining black negative wire from the controller will go directly to the negative pole of the battery. Now use a piece of red scrap wire and connect it to the (common) or center pole of the toggle switch and then to the positive pole of the battery. Now the blue antenna wire needs to be laid across the bottom of the frame. Any configuration will do. If you become confused with the wiring, just check the wiring diagram.

11. With the battery now sitting flat on the bottom of the housing compartment and the controller now sitting on top of the battery, all the connected wires can now be placed around the two three-eighth-inch half round openings that were cut in **Step 5**, which should give enough clearance to replace the deck or the top housing cover.

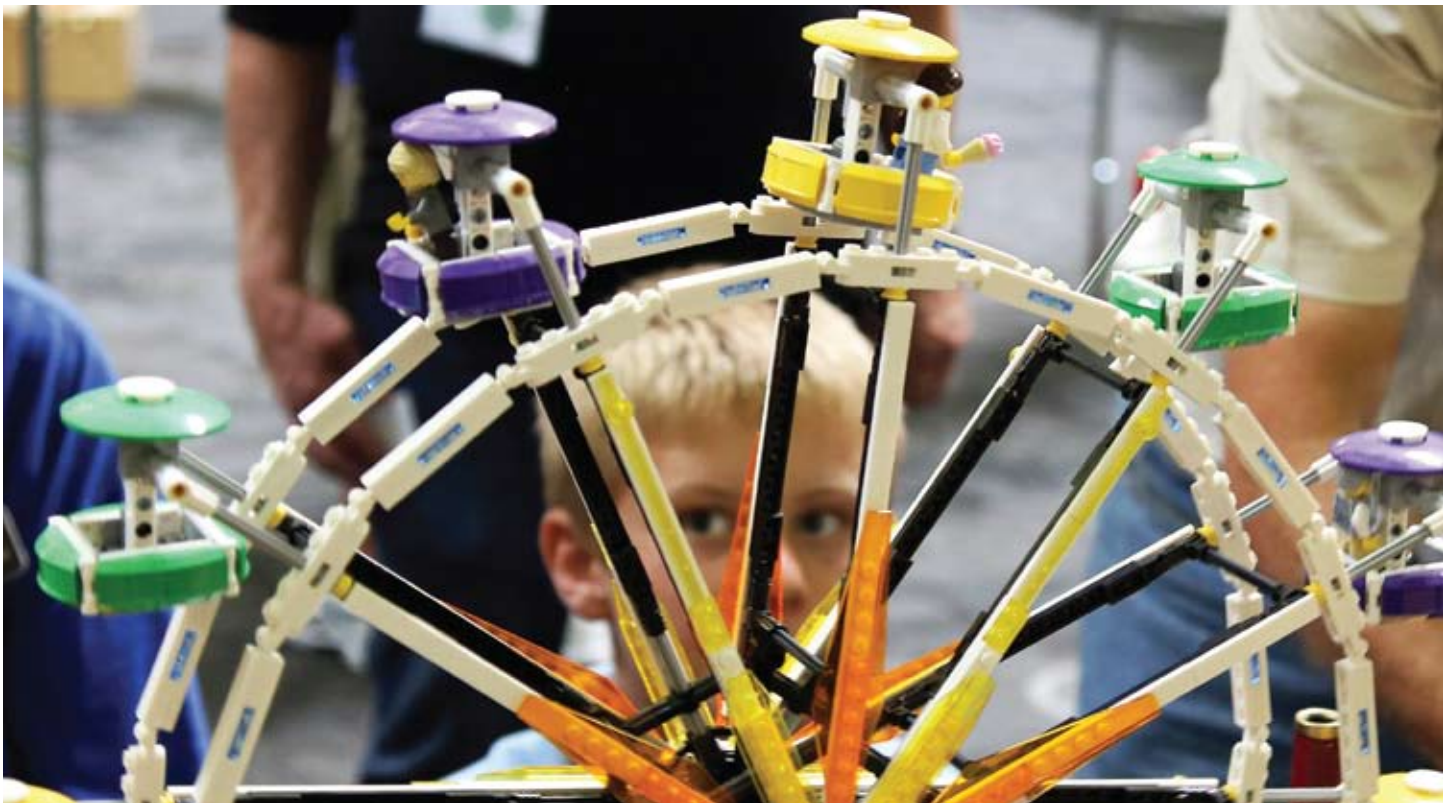
Be sure to check that all the wires aren't being pinched as there is little room. The top cover must sit flat against the housing when screwed in place.

12. Now reinstall the truck assembles, and you're ready to try it out. Your hand-held transmitter has two buttons, on and off. The on button will operate the dump action and the off will stop the dumping at any time even if the cycle has not been completed. Operating range is about 30 feet using the nine-volt battery.

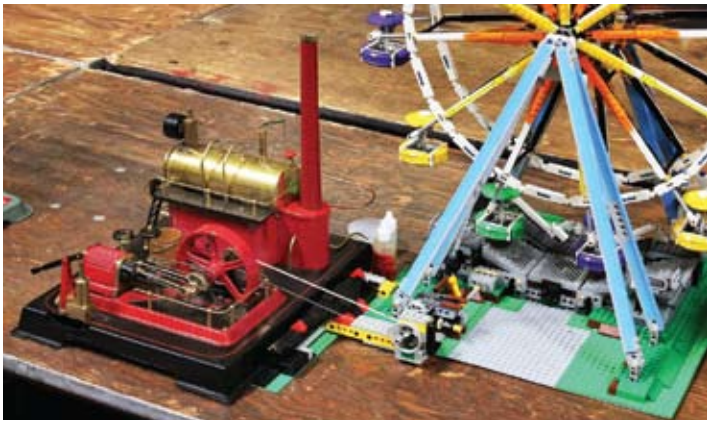
A little more Summer Steamup — steam toys are featured and operated on Saturday evening

STATIONARIES

Photos by Rick Parker



Wonder: *A young steamer gazes upon the toy Ferris Wheel that dominated the stationary table.*



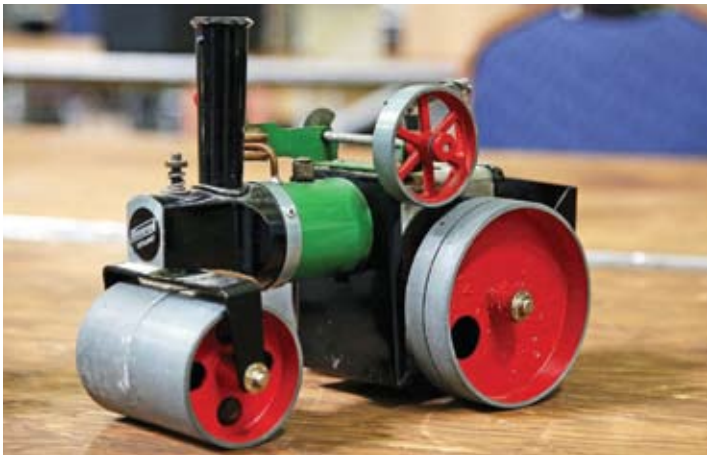
Mechanics: *How the Ferris Wheel was attached.*

Cutaway: *Demonstration engine explains operation.*

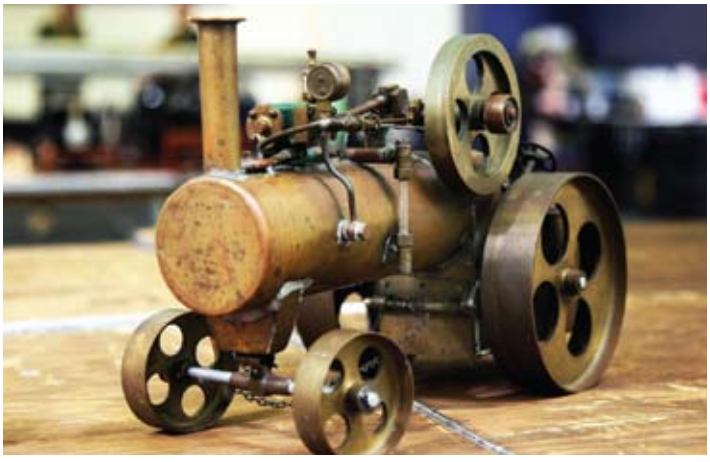
Enthusiast: *Mike Martin has many stationary toys.*

Admiring: *Paul Brink, left, and George Crabb look on.*

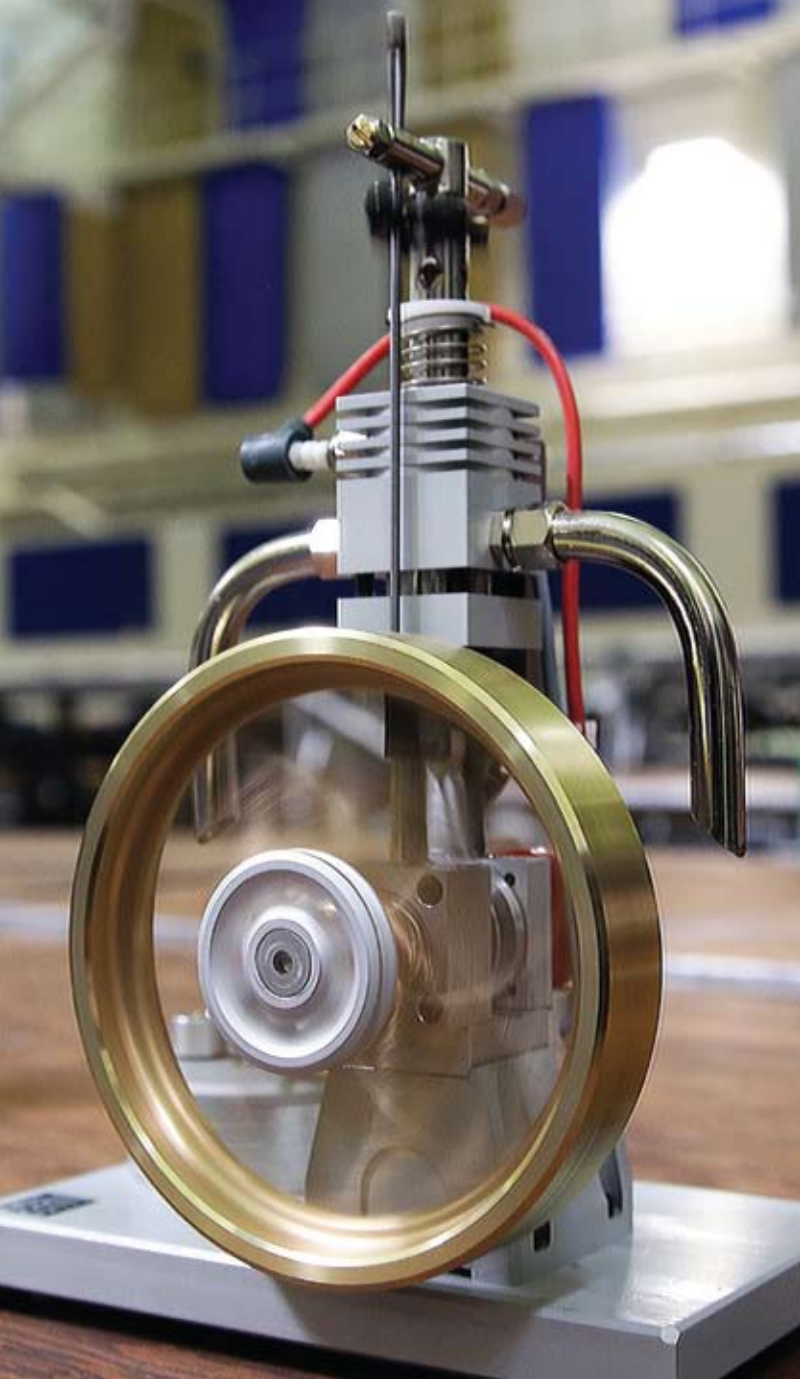
Hot: *Fire roaring in pan of steam boiler.*



Steam roller: *Colorfully painted Mamod toy.*



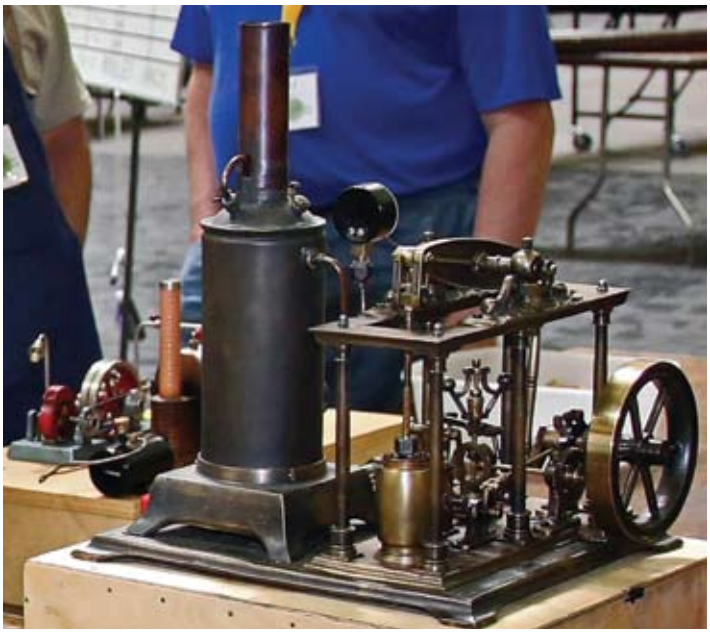
Steam tractor: *Unpainted toy with sight glass.*



At speed: *Steam engine spins its flywheel.*

Setup: *(l to r) Jim Gabelich, Pete Comley and Jim McDavid at the toy table. Photo by Harlan Chinn.*

Unique: *Model of Heron of Alexandria's Steamball.*



Ancient: *All-brass engine from the 1800s.*

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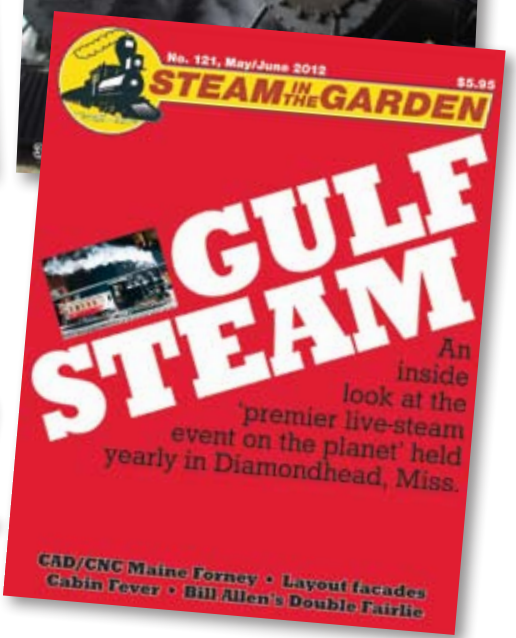

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Metric?

Am thoroughly enjoying Rob Lenicheck's articles on a coal conversion (*Steam in the Garden,* May/June-July/August 2016, Nos. 145-146 and in this issue, Pages 21-28 and 54-58) and am having to translate various bits for my Gauge One colleagues here in Switzerland.

You might like to pass this on to Rob, however. He comments on "the rather odd 2.242-inches boiler diameter" in No. 146. In point of fact, there's nothing "odd" about it at all — it's 57mm. He's simply looking at it from an inch-person's perspective although the locomotive in question is made in a metric country.

Martin F. Slater
Lucerne, Switzerland

(Editor's note: Rob writes, "Conversion to metric did not even occur to me." But Rob shouldn't take all the blame. Your editor should have seen a red flag with the "rather odd" comment and done a little investigation — which I did not. I apologize to Rob, Martin and all the readers for this oversight.)

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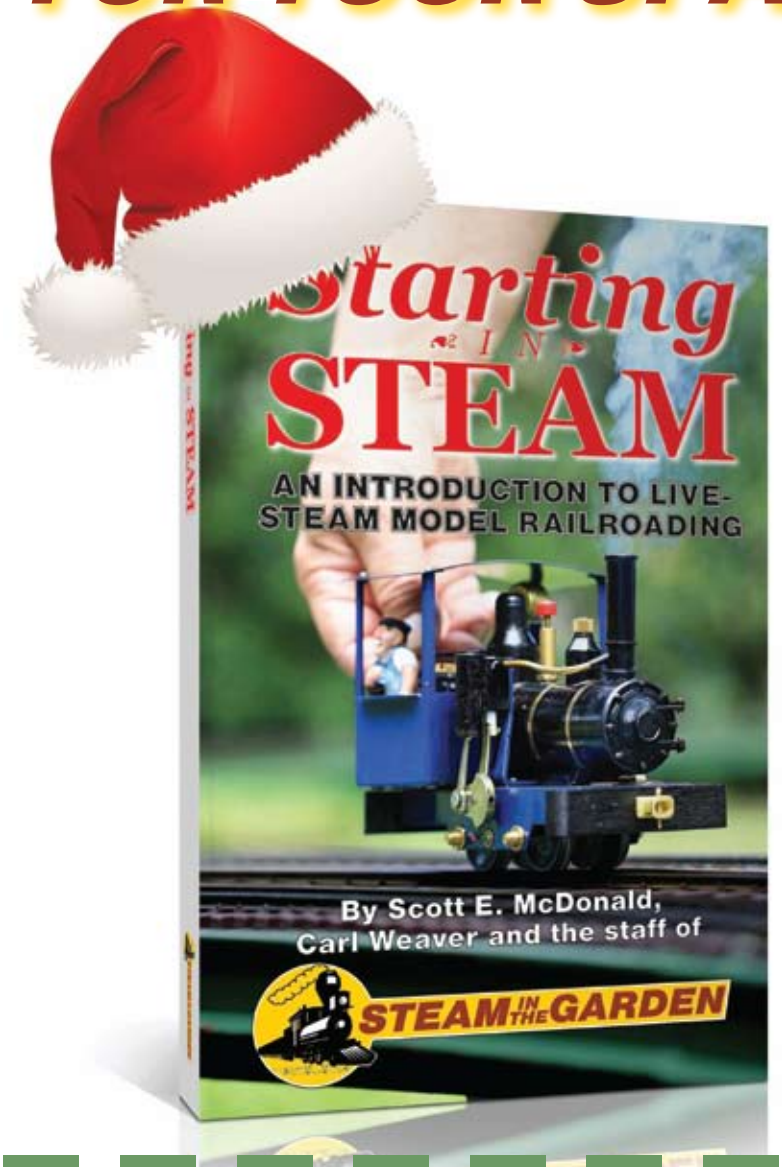

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THE CUPOLA VIEW

Trouble meant 'double'

What you hold in your hand (or are gazing upon in pixels) represents two issues of *Steam in the Garden*. We chose to double up when it became clear that we needed some solution to a missing No. 147 (September/October). Since we had the editorial material, we went with the idea of a "double issue."

Of course, 76 pages isn't quite double the number of sheets in recent magazines, but it does come close to representing twice the amount of non-advertising content of magazines as recently as two years ago.

The lag in publishing is all my fault — I had a serious (and misdiagnosed) illness from June through August and just did not have the energy to work on the magazine. And there was one other thing.

In August 2015 my companion of 25 years and wife, Shirleen Gudmunson, was diagnosed with an incurable brain cancer, and the next month was given one year to live.

Shirleen, as many of you know, was the catalyst that got me involved in small-scale live steam (to be accurate, in 1998 she said I needed a hobby and since I picked this one, she supported my choice wholeheartedly).

One night in mid-2000 at a restaurant we sketched on a cocktail napkin the rough layout of our redesigned backyard that would include two decks and 200 feet of double 45mm track. She commissioned a contractor to design and build the decks that would accommodate the live-steam layout. After the contractor was finished, I added the shelving, pylons and track for the railroad. (Time for contractor to design, get permits and build decks — three months; time for me to build railroad — 18 months.)

Like many live steamers, we had people over to the backyard for steamups but Shirleen also delighted in my running trains for her non-train friends after dinner or during a luncheon on the deck.

Shirleen loved the Pacific Northwest (her first eight years were spent there) and when I told her of Larry Staver's events in Portland, she decided we would go in 2012 to see his layout and schmooze with the *hoi polloi*.

We went again in 2013 and 2014 but neither of us ran trains (we flew those two years). At the latter event, though, Accucraft Trains had just released its new "Fairymead" 1:13.7-scale Australian sugar-plantation locomotive. "Wow," Shirleen said to me, "that is a pretty engine." In addition to the paint and profile, she admired the size of the scale.

When I told her the price, she turned on her heel

'Cupola view' is written by Editor Dave Cole; you can contact him at dmcole@steamup.com or P.O. Box 719, Pacifica, Calif. 94044-0719.

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and sought out Mark Johnson, owner of Las Vegas' Silver State Trains who had a tableful of locomotives for sale at Staver's, and started to ask him questions. Mark came up to me puzzled. "Your wife is asking a lot of questions about that engine, including the price," he said. "She said it isn't for you but for her. Is she serious?" "Probably," I said.

A few hours later Shirleen was the proud owner of a "Fairymead" and Mark taught her how to fire it. (I had spent too many years in relative relationship bliss than to try to teach her how to steam.)

In addition to Staver's, Shirleen ran the sugar-cane locomotive on the Bay Area Garden Railway Society's portable layout when it was at Roaring Camp & Big Trees Railroads in Felton, Calif., and when it was at the Maker's Faire in San Mateo that year, as well as in our backyard when she felt like it. Shirleen had transitioned from being the wife of a steamer, to a steamer.

Despite the cancer, Shirleen was OK during the fall and early winter of 2015 (she did have to go into the hospital for a short stay once and I edited most of one issue sitting in her hospital room) and though she didn't run her "Fairymead," she did keep up many activities, including attending local backyard steamups. She began to deteriorate in late winter and spring of 2016 and by May she was in a nearby care facility and under hospice care.

I spent hours every day at her bedside and my partners in the magazine urged me to not worry about missed deadlines. In addition to my ill health, I just couldn't take time away from her in July — either for the magazine or to attend the two big events outlined in this issue, the garden railway convention and the Summer Steamup (the latter was the first I'd missed since 1999).

Steamer at last: *Shirleen Gudmunson firing her Accucraft 'Fairymead' on the Bay Area Garden Railway Society's layout at Roaring Camp in Felton, Calif., June 14, 2014. Photo by Richard Murray.*

On Aug. 5, I had spent the morning with Shirleen and just after noon rushed out to get some supplies for the house (cat food, most especially) and before I could return, she had passed. I was unable to do much work after that and my magazine colleagues continued to say that I needed to put my own needs ahead of the publication's. Nonetheless, a month after her death, I was able to start focusing on the magazine; but one entire issue had been missed.

So, we are attempting to catch up with this double issue. Shirleen would have wanted me to get back into the swing of work as soon as possible and probably would have griped that I spent too long mourning her. She was that kind of gal (see http://goo.gl/o8Yelo).

If you have a "Fairymead," steam it once around your layout for Shirleen, a steamer at last.

TIMETABLE

Sept. 7-10, 2016 — Thirty-sixth National Narrow Gauge Convention. Augusta, Maine. Layout tours, modeling contest, modular layouts, clinics, dealers' room. Info: http://nngc2016.org. Live steam layout by Owens Valley Live Steamers. Info: Charles Mote, csmote@mindspring.com or Bruce Gathman, shaygearhead@bellsouth.net.

Sept. 15-18, 2016 — Fall Steamup, Staver Locomotive, Portland, Ore. Info: http://www.staverlocomotive.com.

Nov. 25, 2016 — Turkey Trot Run, invitation-only Gauge One steamup. Pennsylvania Live Steamers, Collegeville, Pa. Info: http://www.palivesteamers.org.

Jan. 8-15, 2017 — International Small Scale Steamup and Arts Festival, Diamondhead Inn and Suites, Diamondhead, Miss. Called "the most important small-scale event in the United States," Diamondhead includes 24-hour steaming, a "flea market," seminars, dealer tables, a festive meal and extracurricular activities. Diamondhead Inn & Suites: (228) 255-1300. Info: Patrick Darby, k5pat@bellsouth.net, (985) 867-8695; http://www.diamondhead.org.

Jan. 13-15, 2017 — Cabin Fever Model Engineering Expo, Lebanon Valley Expo Center, Lebanon, Pa. Info: http://www.cabinfeverexpo.com.

Feb. 10-12, 2017 — 19th Annual Presidents' Day Steamup, Electric City Trolley Station & Museum (Steamtown), Scranton, Pa. Two tracks in G-gauge and 0-gauge. Info: Mike Moore, mike@aikenback.net.

March 25-26, 2017 — East Coast Large Scale Train Show, York Fairgrounds, York, Pa. Aikenback Live Steamers will set up its 54-foot, double-tracked and dual-gauged (32mm and 45mm) layout, with 10-foot curves, at this event. Info: http://www.eclsts.com and Mike Moore, mike@aikenback.net.

April 20-23, 2017 — Spring Steamup, Staver Locomotive, Portland, Ore. Info: http://www.staverlocomotive.com.

July 10-15, 2017 — National Garden Railway Convention, Tulsa, Okla. Self-guided and motorcoach tours of area garden railroads; clinics, vendor hall. Info: http://thinktulsa2017.com.

July 19-23, 2017 — National Summer Steamup, McClellan, Calif. (*Note new dates.*) Multiple layouts,. Lions Gate room reservations: (916) 643-6222 (http://www.lionsgatehotel.com). Info: http://www.summersteamup.com or (408) 776-1133.

July 30-Aug. 6, 2017 — National Model Railway Association Convention, Indianapolis. Clinics, layout tours. Info: http://www.nmra2017.org.

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 Comely at (253) 862-6748.

Michigan Small Scale Live Steamers (MSSLS). Info: http://www.mssls.info.

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.

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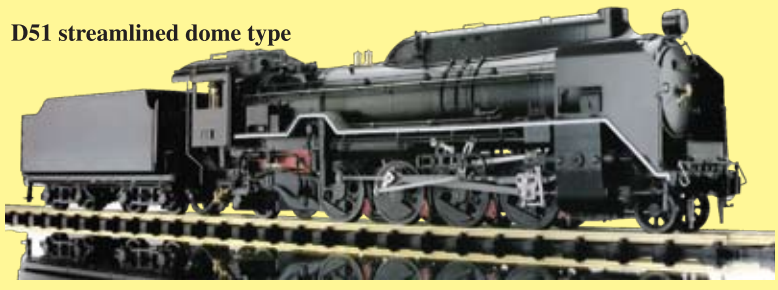

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