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EMMA!

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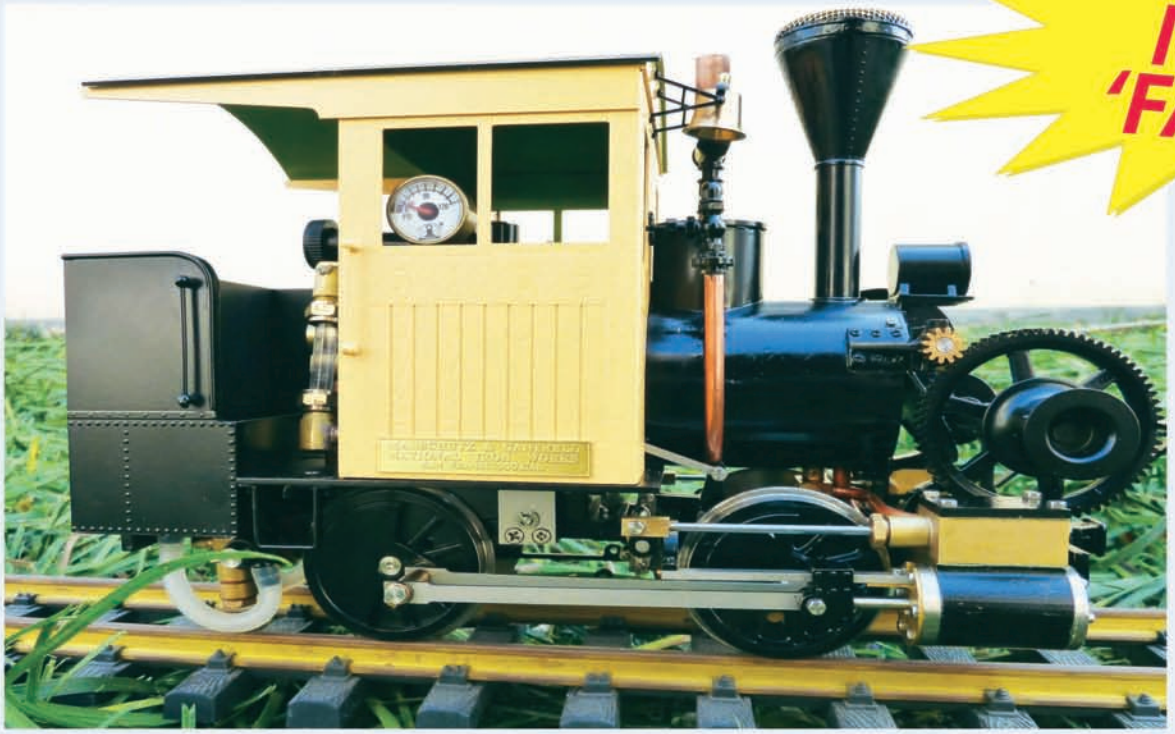
New model No. 1 'FALK'



The capstan winch on the front of this 0-4-0 1:20.3-scale logging locomotive makes the No. 1 "Falk" unique. The prototype was built by Marchutz & Cantrell of San Francisco in the 1880s and ran on the Elk River Mill & Lumber Co. near Arcata, Calif. This fine brass and steel model is gauged for 45mm track (G-gauge) and comes as a live-steam (butane fuel) or electric engine. 8¾-inches long, by 4¼-inches wide, by 6-inches tall, this locomotive weighs in at five pounds and runs for more than 10 minutes.

BRITISH A4 in 1:32 scale
This 4-6-2 locomotive has three working cylinders, is butane-gas fired and has a ceramic burner. It is 27-inches long, 3½-inches wide and 5-inches tall and weighs 13 pounds. It negotiates eight-foot radius curves, has automatic water feed and a whistle.

BRITISH BLACK 5 in 1:32 scale
All brass model of LM&S' 4-6-0; G-gauge with whistle. 24¼-inches long, 3½-inches wide, 4¾-inches tall, 11 pounds. Single-flue, butane-fired boiler, runs more than 60 minutes with automatic water feed.

BRITISH 8F in 1:32 scale
Real Stephenson valve gear highlight this butane-fired model of the LM&S 2-8-0. 24-inches long, 3¼-inches wide, 4¾-inches tall, 11 pounds Run-time of 50-plus minutes with auto water feed on four-foot radius curves.

BRITISH 4MT in 1:32 scale
Radio-controlled G-gauge (45mm) model of 2-6-4 locomotive; single-flue, butane-fired boiler with Stephenson style valve gear. 16¾-inches long, 3½-inches wide, 4¾-inches tall, 6.4 pounds.

QIANJIN No. 7207 in 1:48 scale
Model of typical Chinese steam locomotive; 2-10-2 prototype built by Datons factory in 1988. 24-inches long, 2¾-inches wide, 4-inches tall, 10½- pounds. Electric 0-gauge (32mm).

COACHES: MK1 Coach in 1:32 scale
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DRGW C-25 The locomotive was nicknamed "Baby Mudhen" similar to a K-27 "Mudhen"

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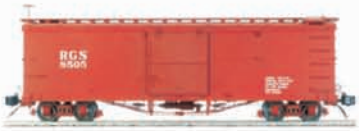

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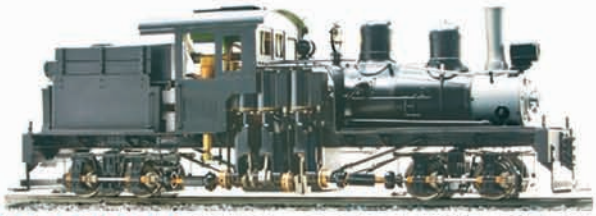

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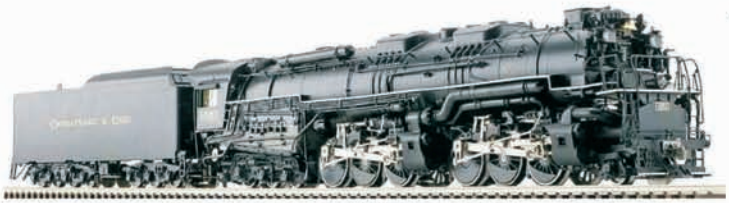

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Vol. 23, No. 4; Issue No. 128; July/August 2013

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Cover: Accucraft's latest, the 1:13.7-scale 'Emma,' in Sonora, Calif. Photo by Dave Frediani.

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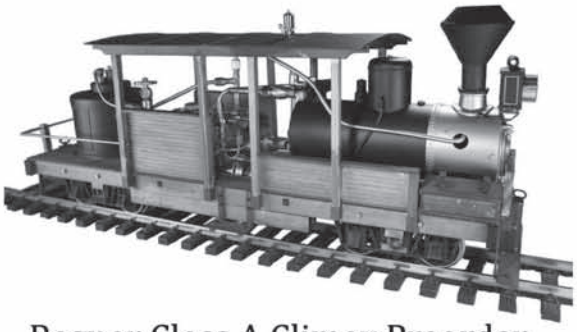

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RAILWAY POST OFFICE

No change in physics

I recently bought the first three years of *Steam in the Garden* on eBay. It sure is interesting reading through the old magazines. What I found most surprising is how much is the same now as it was then. But the physics of live steam doesn't change, does it? But the magazine has sure come a long way from the six stapled-together pages of No. 1. Keep up the great work.

— Rik Beeson
Santa Cruz, Calif.

More on the C-25

I thought I'd send some additional history to what Carl Weaver offered ("Based on a Baldwin," *Steam in the Garden,* May/June 2013, No. 127). The locomotive was indeed Construction No. 21757 built in 1903. However, Crystal River sold Nos. 101, 102 and 103 as Nos. 37, 38, and 39 to the Rio Grande Southern Railroad in 1914.

RGS Superintendent W.D. Lee was in the process of rebuilding the line to accommodate larger locomotives, but by mid-1916 time had run out, so the three never-run 2-8-0s were sold to the Denver & Rio Grande, becoming Nos. 430, 431 and 432 (class 112). In February 1924, they were classed/renumbered 360 and 361 (C-21) and 375 (C-25). No. 375 was rebuilt as described in the 1920s.

Storied loco: *Accucraft's model of the Denver & Rio Grande's C-25 in Virginia. Photo by Carl Weaver.*

The RGS made another attempt to get No. 375 in 1938 by trading its Ditcher 030 for it, but cancelled the deal a week before it was to transpire because the trackage could still not handle that engine. No. 375 never got a lot of use, mostly sitting in the Durango roundhouse and being "pulled out more for pictures than to be run" according to a retired employee I knew.

— Dennis O'Berry
Oceanside, Calif.

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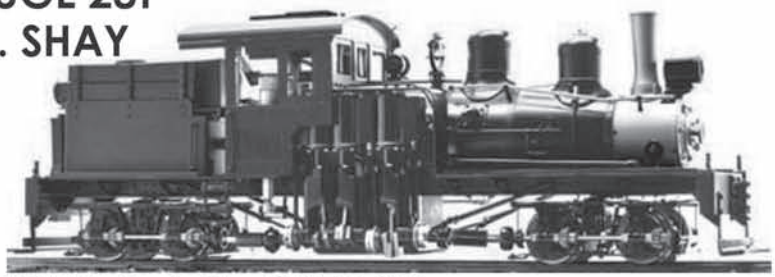

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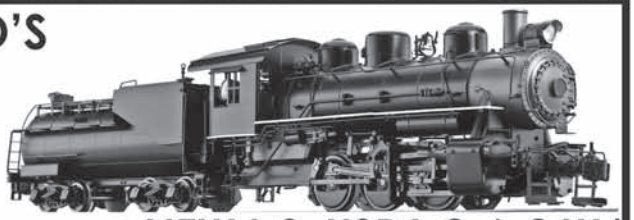

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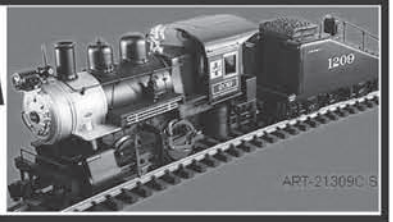

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LATEST WAYBILL

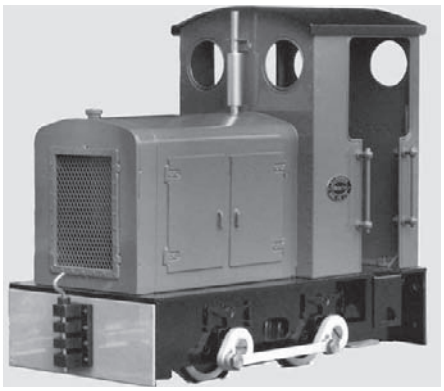
Roundhouse releases two

An outside-framed 0-4-2 live-steam model of a locomotive used in the 1940s in Rhodesia (today the Republic of Zimbabwe) and a battery-powered freelance model of a diesel-electric switching engine highlight the latest offerings from Roundhouse Engineering Co. Ltd. of Doncaster, England.

The prototype for the live-steam model, "Karen," was built by Peckett & Sons Ltd. of Bristol, England, in 1942 (construction No. 2024) and was one of three locomotives built for the Selukwe Peak Light Railway in Rhodesia (her "sisters" were "Ivy" and "Mary"). The Peckett & Sons engines were used to carry chrome ore on a six-mile-long railroad that had two-percent grades, according to a web page of the Welsh Highland Heritage Railway.

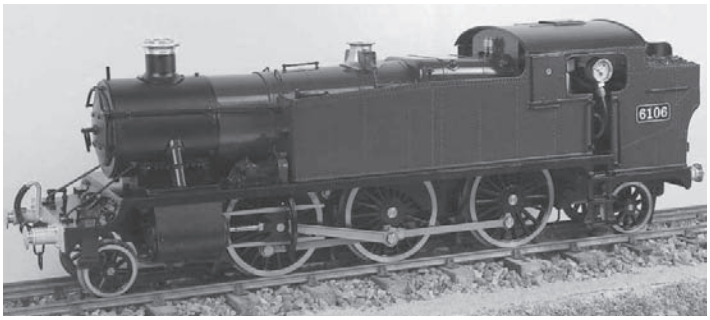
"Karen" was acquired in 1976 by a consortium of Welsh Highland members, was restored and in 1983 began hauling tourists in Porthmadog, Wales. After a decade of service, "Karen's" boiler needed a major overhaul and she now is a static display.

The model uses Roundhouse-standard, dual double-acting, slide-valve cylinders, inside-valve gear and the company's "FG"-type burner. It is offered for 32mm or 45mm gauge track and an optional gauge-conversion kit is also available. Standard controls include a steam regulator, safety valve, pressure gauge, displacement lubricator, gas regulator and reversing gear.

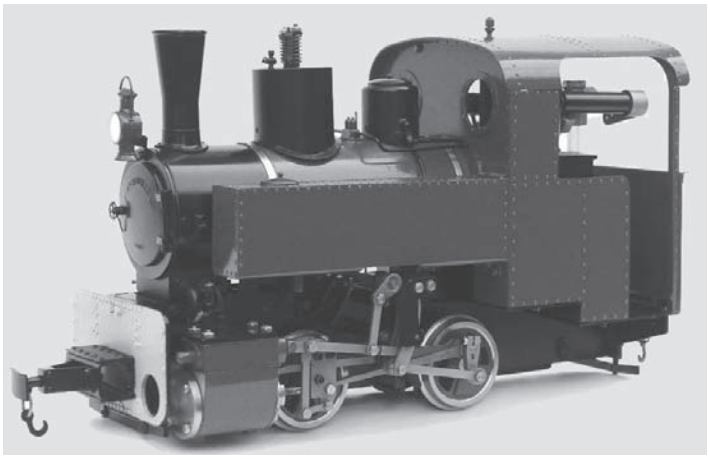


Roundhouse's latest: *Top, new 0-4-2 live steamer 'Karen.' Bottom, the battery-powered 'Little John' switcher.*

"Karen" is 12¼-inches long (313mm), 4 7/16-inches wide (113mm) and 6¼-inches tall (159mm), weighing in at a little more than eight pounds (3.7kg). Optional 2.4GHz radio control is also available. A manual-control "Karen" will have an estimated price of $2100 and first deliveries are expected "this summer."



Commuter: *A 1:32-scale live-steam model of GWR's 6106 is coming from Accucraft UK Ltd.*



Industrial: *French engineering highlighted in 0-4-0 'Decauville,' in 1:19-scale by MBV Schug.*

Roundhouse has also announced "Little John," a battery model of a diesel switcher. The model, Roundhouse says, "has been designed and built to be equal in performance to our steam models."

The switch engine includes "a high-powered motor and tough nylon gear set" and is powered with eight Double-A, NiMh batteries that can be recharged in the engine or outside. It comes with radio control and is gauge adjustable between 32mm and 45mm track. "Little John" is expected to retail for around $820.

Roundhouse is represented in North America by The Train Department of Hazlet, N.J., (732) 770-9625, which is on the Web at http://www.thetrain-department.com while Roundhouse itself is on the Web at http://www.roundhouse-eng.com.

New overseas locos from Accucraft

Retailers representing Accucraft Trains Co. in the United Kingdom, Germany and the United States have commissioned the company to build four new locomotives — a Great Western Railway 2-6-2T, two versions of a Decauville narrow-gauge, in both 0-4-0 and 0-6-0 configurations, and an American-built locomotive that still runs in Australia.

The GWR is based on the 6100-series of locomotives, built in the early 1930s and used primarily for commuter service in the greater London area. The model will be 1:32-scale for Gauge One track, built from stainless steel and brass. It will be 15½-inches long (390mm), 3½-inches wide (90mm) and 4¾-inches tall (119mm). The center-flue boiler will be fired with butane and will support 60psi working pressure. Fittings include a safety valve, pressure gauge, water gauge, steam regulator, gas regulator, reverse lever and lubricator.

Commissioned by Ian Pearse at Accucraft UK Ltd. of Shropshire, England, the 6100-series will be offered in a variety of liveries, including numbered as No.

6106, the only preserved version of the engine.

Société Decauville, a French manufacturer, pioneered the use of narrow-gauge railways for industry and developed a modular track system that was based on a 600mm (23⅝ inches) gauge. MBV Schug of Detzem, Germany, the European dealer for Accucraft, has helped design the 1:19-scale locomotives that can be ordered in either 32mm or 45mm gauge.

The "Decauville" 020T, which has a Whyte notation of 0-4-0 with saddle tanks, will be about 8½-inches long (213.5mm), 3½-inches wide (89mm) and about 5½-inches tall (138.6mm), while the "Decauville" 030T, an 0-6-0 with saddle tanks, will be 9¼-inches long (234mm), 3½-inches wide (89mm) and about 5½-inches tall (138.6mm).

Both locomotives will include a single-flue boiler, D-valve cylinders, a pressure gauge and a sight glass, said Lorenz Schug, the dealership's proprietor.

MBV Schug is taking reservations for "Decauvilles," though the prices have not yet been determined.

The Train Department's Jason Kovac of Hazlet, N.J., has helped Accucraft design a 1:13.7-scale 0-4-2T locomotive based on a two-foot-gauge engine built by Baldwin in 1889 for the A.H. & E. Young Co. of Queensland, Australia, operating as Fairymead Sugar Co. Ltd. "Fairymead" No. 1 was decommissioned in 1956 and was restored by the New South Wales Rail

Sugar: *A 1:13.7-scale Accucraft model of an 0-4-2T that's still in Australia, by The Train Department.*

Transport Museum in Australia in the mid-1990s. It is now at Lake Macquarie Light Rail in Toronto, New South Wales, where it runs in tourist service.

The model will be 13.6-inches long (345mm), 5.6-inches wide (142mm) and 7½-inches tall (191mm), with a single-flue, butane-fired boiler, two cylinders and real Stephenson valve gear, as well as cylinder drain cocks, a hand pump in the rear bunker, a lubricator and a sight glass.

FEF3: *Aster says it will build a 1:32 model of U.P. No. 844, shown here near Painted Rocks, Nev., in 2009. Photo by Drew Jacksich.*

"Fairymead" will come in two liveries; all black unlettered and in the Baldwin colors of green and gold with a lettered name. The latter will have a suggested retail price of $2200 while the former will be $2000.

Accucraft Trains, based in Union City, Calif., is at http://www.accucraft.com or at (510) 324-3399, while Accucraft UK Ltd., is at http://www.accucraft.uk.com or at +44 01694-723799, MBV Schug's address is http://www.accucraft.de or at +49 6507-802326 and The Train Department is at http://www.thetraindepartment.com or at (732) 770-9625.

Aster goes with another U.P. main liner

Following in the successful footsteps of last year's release of a live-steam model of Union Pacific's "Challenger" 4-6-6-4, Aster Hobby USA LLC said recently its next U.S. locomotive would be the Union Pacific FEF3, No. 844.

FEFs — which stands for "four-eight-four," the Whyte notation of the locomotive — were delivered in three batches to U.P. by American Locomotive Co. (Alco) between 1937-1944. No. 844 was the last steam locomotive delivered to Union Pacific and is the only U.S. steam locomotive to never be decommissioned. U.P. uses it for excursions and public-relations purposes.

Aster Hobby USA of Campobello, S.C., has provided no details on the model, except to say that it will be in 1:32 scale and "will equal or better in detail, performance and appeal with any earlier released Aster U.S. prototype model."

Hans Huwyler of Aster Hobby USA said he will assist Aster Hobby Inc. of Japan in the model's development. He says the model will appear in two liveries, black as preserved and the "greyhound" livery of No. 837.

"Expected release date is projected for late 2014," said Aster Hobby USA, which is on the Web at http://asterhobbyusa.com or by phone at (864) 587-7999.

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Building a new boiler to experiment with various

FUELS

Text and photos by Eric Schade

As a winter project in 2012, I decided I would like to build a small tank engine based on Accucraft's "Ruby" chassis. I thought it would be interesting to build my own boiler for it, which could burn a variety of fuels including coal, wood pellets, alcohol and butane. I based the engine on a prototype which is preserved at the Boothbay Railway Village Museum in Maine, not far from my house.

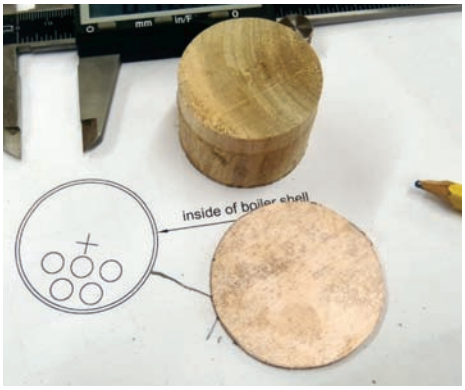
The S.D. Warren Paper Co.'s No. 2 is in the process of being restored to operation by volunteers at the museum. It was built by the Baldwin Locomotive Co. in 1895 to run on the mill's two-foot gauge industrial tram way. I decided to build it to a scale of 7/8-inch to the foot (1:13.7) which is the correct scale for two-foot gauge equipment on 45mm (Gauge One) track.

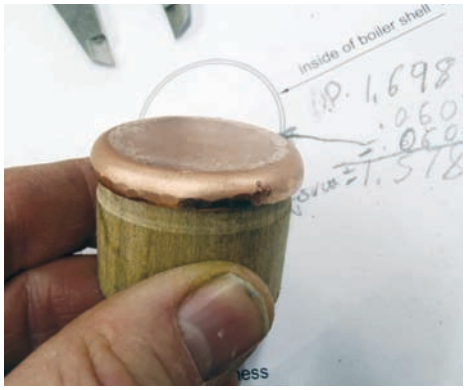
Coal experiments: *A little train rattles past with the coal-fired S.D. Warren No. 2 leading the way on the author's layout in Maine.*

Last issue I discussed building the boiler; this time I'll bring you up to date on the project and discuss some of the issues involved with burning the various fuels.

To improve the draft for the fire, real steam locomotives vent the exhaust steam up the smokestack. This was necessary on this model also. Butane fired engines do not need to do this as the burner provides its own draft. Common wisdom states that the nozzle end of the blast pipe where the steam jets up the stack should be 1/10th the diameter of the cylinders.

I made a tube which screwed into the reversing block between the cylinders. This hole is unfortunately



Tube sheet: *Left, a disk of copper is cut for the front (end) tube sheet. Center, the copper was hammered into a cup shape around the hardwood form. Right, oversized tube sheet on form after the final hammering.*



Boiler components: *Left, the tube sheet being machined down for a snug fit on the boiler. Other pieces were made the same way; center, the throat piece, and right, the rear of the boiler fire box.*

not located directly under the proper location for the smokestack. I therefore bent the tubing into a zigzag so it would blast the steam straight up the stack.

A small tube was run from a valve in the cab into the smoke box to serve as a "blower" to keep up the draft when the engine was not running. The end of this tube was pinched down over a small drill's shank to get a small orifice of about 0.020-inch in diameter. The valve in the cab has a simple lever for a handle to make it quick and easy to operate and so the engineer can tell at a glance whether it is open or closed.

The geometry of the smokebox has a lot to do with how the fire will burn. I started by making it possible to slide the smokestack up and down to see what effect that had on the fire. With the blast pipe nozzle located about three-quarters-inch below the base of the smoke stack seemed to work out pretty well the smoke stack has an inner diameter of 0.465-inches.

There is a set of ratios used for smoke box geometry. The ratio of 3:1 seems to be the maximum ratio of distance from the blast pipe to the bottom of the smoke stack and the inner diameter of the base of the stack. The ratio of six-to-one seems to be the minimum ratio between the distance from the top of the blast pipe to the top of the smoke stack and the diameter of the top of the smoke stack.

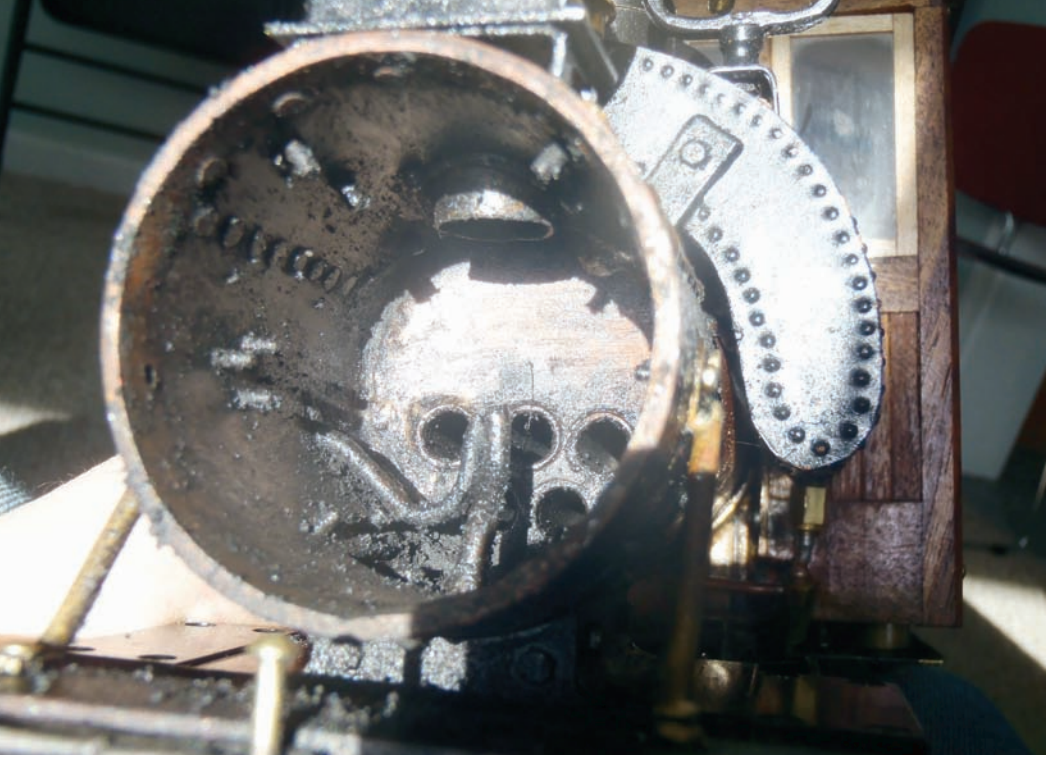
My locomotive has the first ratio more like 1.6-to-1 as the blast pipe is quite close to the base of the stack and the second ratio is more like 7.6-to-1 as the stack is tall and thin. Moving the stack down seemed to reduce the draft moving it up helped. I also made a larger diameter stack as a test. This stack was 0.625-inch and started about one-inch above the blast pipe. With coal fire, it seemed to help draft a bit making the engine "breathe easier," however it did not seem to improve the fire when burning alcohol.

I checked the full-scale smoke box of Wiscasset, Waterville & Farmington No. 10, which is a similar sized and proportioned engine to the prototype S.D. Warren engine, which is at the WW&F Railway Museum in Alna, Maine. It is about 18 inches from the blast pipes to the bottom of the stack and the stack diameter is just over six-inches.

The stack is about 44-inches tall from the base inside the smokebox to the top which is flared up to about eight-inches. The numbers work out so the first ratio just less than three and the second 7¾.

I tried several fuels with varying success. The first fuel I tried was wood pellets as sold at the local hardware store for home heat. I had built a grate for use with coal with one-eighth-inch spaces between stainless steel bars. With this grate, the pellets burned well with a smoky fire which looked great.

They did produce enough heat to run the locomo-



Smoke-box geometry: *Blast pipes exhaust steam from cylinders up the smoke stack, causing a vacuum in the smoke box to draft the fire.*

Second coal grate: *An improved fire grate fits up against the bottom of the fire box, which gives a deeper bed of coal for a better fire (it's also easier to clean).*

tive; however, frequent stoking was required. Also the smoke contained creosote which gummed up the boiler tubes after a couple of runs. I had to scrape the hard substance out of the flues with a little home-made scraper.

Coal

I also tried coal. At the time Welsh coal was recommended but difficult to obtain. I had access to some soft coal dust which was unusable by the WW&F railway museum, but sized well for this model. Starting the fire on lamp-oil-soaked wood pellets, I could get the soft coal burning well enough, and it provided good heat, however as the run continued, the coal stuck together such that I had trouble adding more to keep running. It too, smoked nicely and once the fire was out, cleaned up pretty well.

I also got some Pennsylvania anthracite from a friend who burns it in a coal stove in his house. I could never get this stuff lit even by adding it to a roaring soft-coal fire it would come out of the ashes unblemished.

Finally I was able to get a batch of Welsh coal from Jason Kovac at The Train Department of Hazlet, N.J. I was sure this was going to be the real deal and I would be off. It didn't work out as well as I had hoped, so I started experimenting with the smokestack design and other variables.

Then hobbyist and boilermaker David Bailey from the United Kingdom suggested I needed a deeper fire. As the original grate stuck up into the bottom of the fire box, I lost about one-quarter-inch of space. I built a new grate which fit up against the bottom of the fire box gaining back that one-quarter-inch.

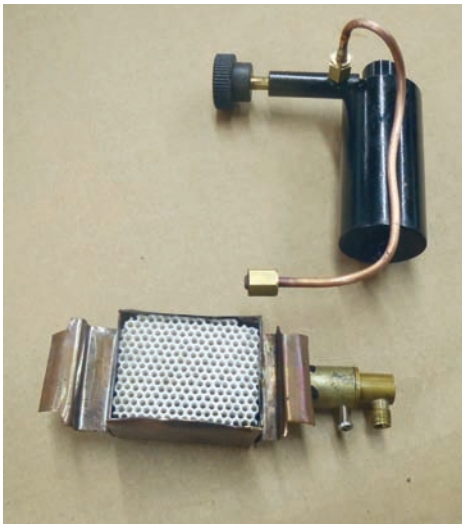
With that installed, the Welsh coal worked quite well. I got a good strong fire with more sustainable running and less stoking. I have only run the engine with the new grate and the old thin smokestack. The Welsh coal burns quite cleanly and with minimum odor.

During my tribulations with coal firing, I experimented with alcohol. I made a fuel tank that resides in the cab and which meters alcohol into a sump under the deck. The sump feeds the burners in the fire box. I made the burner and fuel tank easily removable so the engine can be re-configured for other fuels.

The fuel tank has a valve to control the rate alcohol is delivered and a vent which sits down in the sump which only breathes when the level in the sump is low and more alcohol is required. The sealed tank will only drip out fuel when air comes in the vent. The metering valve must be closed when the fill cap is opened or the alcohol in the sump and burners will over flow.

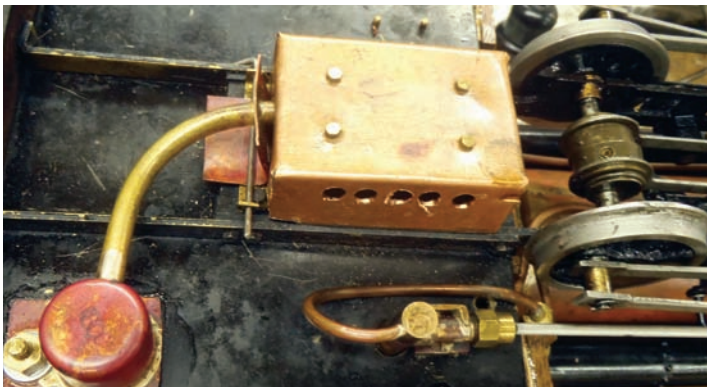
I tried several materials as wicks, including fiberglass yarn and braided material which worked well but tended to melt into little glass balls and fall out of the burner if it was inverted. I had heard that some folks had tried fine stainless-steel mesh which I happened to have. I cut a strip about two inches long by five-eighths-inch wide. I slit one long edge with scissors so it could be "tufted" to look like conventional wicks giving more surface area for the fire.

I rolled the strip up tightly then squashed it and then re-rolled it the opposite way so it would be more open when inserted into the burner pot. Finally I spread the "tufted" edge of the mesh out so it looked like a ragged mushroom. In practice these



Butane burner: *A ceramic burner was fabricated from a piece of perforated tile held in a copper box with a copy of 'Ruby's' burner tube and stock fuel tank and jet.*

Test firing: *The coal fire needs a good, deep bed of coals to burn well.*



Alcohol: *Left, the alcohol burner tubes were packed with various wick materials. Right, a wind-screen box reduces the amount of air drawn up into the fire box and increases the heat and efficiency of the burner.*

wicks seem to burn about the same as the fiberglass wicks and are much more robust. They do not fall out of the burner and are not damaged by the flame even as the last of the fuel is depleted.

It turned out that I needed two improvements to get the alcohol burner to run the engine reliably. I added a stainless steel deflector "arch" which deflected the fire back toward the fire door and away from the boiler tubes. This seemed to give the fire more time to complete its combustion.

The second addition was a box under the firebox which reduced the amount of air allowed in. It seemed that too much air cooled the boiler somewhat. At first small air holes were added to the box but they were then enlarged. With the addition of these two parts, alcohol firing became a robust way to power the little engine.

One final experiment, this time using butane, was tried. I had purchased a piece of perforated ceramic tile which was intended as a burner. The three-eighths-inch thick tile was perforated with hundreds of 1/16-inch holes. I cut a little rectangle of tile to fit into the fire box. I then made a copper box to hold the piece of tile and serve as a mixing box for air and butane.

I copied the geometry of the Venturi portion of the "Ruby" kit's burner and silver soldered this into the box. I used the "Ruby's" stock fuel tank with an extended fuel line and stock jet to feed fuel into the burner. This experimental burner seemed to work quite well and uses butane at about the same rate a stock "Ruby" would for the same amount of work.

I made all the burner systems easily interchangeable using just a couple of screws and two pins. I find it fun to be able to switch between coal — for fun outside running — to alcohol — for less hands-on extended runs — to butane — for clean easy running especially for indoor running where safety is a concern.

While still no expert, I did learn a lot about making effective boilers for little locomotives and some of the factors that make them successful.

Series Part Three

For the starting-out small scale steamer, where to get HELP

Text by Scott E. McDonald

Starting IN STEAM

The first step into becoming a live steamer is to put the personal pride on the shelf: Admit that while you can read every magazine and book, watch every educational video on DVD or through the Internet, you are going to make mistakes. It's all part of the learning. Like any hobby, we all have our own experiences and we each develop a personal mantra of what works best for "me."

You will ultimately develop what you like best and even the best teachers know that their students may go out into the world and follow their own instincts regardless of how the education they received prepared them to be functional. Over the course of the years my own personal preferences have changed as I became more comfortable with what would be a new aspect or way of running trains. So too will you develop what you are comfortable with. Seeking out a mentor is the best way to get started. I have had many over the years and their counsel has helped me out of many situations where my non-mechanical mind could not.

Local groups

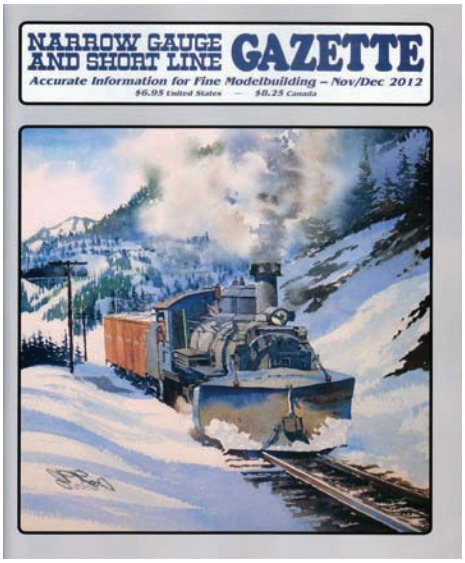
The first organization I joined was my local garden train club (they're usually called "garden railway societies"). We had a wide variety of interests within the group and there were a couple of us who would in time become known as the "live steamers." I learned through other members' mistakes all about track work and building a garden railway. And while the primary focus was on electric and battery power, I could garner from the many discussions what would work for me and live steam.

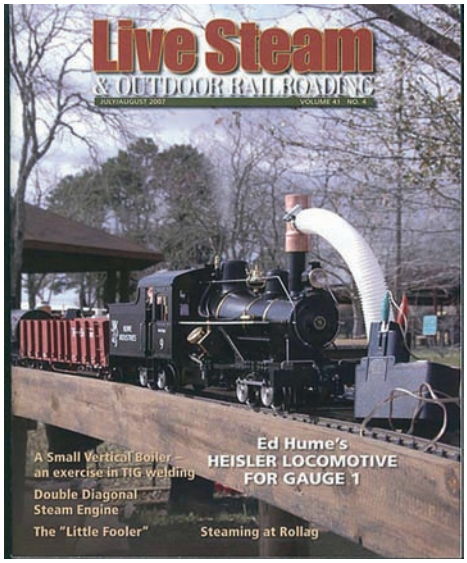
The lesson here is that while the primary motive power of an organization might not be steam, joining a local train club that focuses on our scale of trains will give you some insight into the hobby that you can apply to some aspect of live steam.

Probably the biggest question that comes up with respect to groups is whether or not there are small-scale live steam clubs. Well the answer is that there are, and they come in all forms. Some are sub-groups of larger ride-on clubs who have a permanent track at the club site. Many of the large-scale steam clubs — 4¾-inch (or five-inch) to 7½-inch (or 7¼-inch, depending on where you live) — have or are starting to build tracks for the 32mm- and 45mm-gauge crowd.

There are several garden rail societies where in addition to the electric, the live steam is also well represented. Some of these garden train groups create public displays that incorporate both electric and steam with separate tracks in the same display (or have completely separate portable layouts). There are also sub-groups of garden railway societies who get together and hold steam-only events.

And then there are non-clubs — a bunch of friends





Magazines: *Left, fine-scale modeling in* Narrow Gauge & Short Line Gazette. *Middle, all-gauge steaming in* Live Steam & Outdoor Railroading. Right, the *Newsletter & Journal* of G1MRA.

who get together on a regular basis at a home or put up a portable track at an event.

Many large-scale events now include local steam groups who have portable layouts set up where steamers can demonstrate small-scale live steam for the general public. The best place to find out if there will be steamers at an event near you is to first check out the event's web site.

Live steam is a good draw for the public, as a lot of people love watching and learning even though they may not think that it is for them. The "Timetable" on the *Steam in the Garden* web site, Steamup.com, is also a good place to find announcements for steamups.

Media

OK. You know about magazines because you're reading one right now. Congratulations on picking up *Steam in the Garden*, as it shows you are serious and want to learn. This magazine attempts to cover a broad range of small-scale live steam issues, including reviews of new models, articles about building locomotives and rolling stock and workshop features that show you how to build items for your railroad. Some of these workshop articles will be easy to understand and then there are those that are geared toward the home machinist, whose education is a little more advanced.

In addition to *Steam in the Garden*, there are domestic magazines that cover small-scale live steam peripherally: our friends at Kalmbach Publishing Co.'s *Garden Railways* provide a number of live-steam articles every year, while the fine-scale modelers at *Narrow Gauge & Short Line Gazette* also touch on live steam. Westlake Publishing's three annual books, "Logging, Mining & Industrial Annual," "The Narrow Gauge Annual" and "The Modelers' Annual," all have articles that touch on live steam. Village Press Inc. publishes the semi-monthly *Live Steam & Outdoor Railroading*, which writes about the ride-on scales, but material there can apply to small scale as well.

Overseas, the Gauge One Model Railway Association in the United Kingdom produces a six-times-per-year *Newsletter & Journal* that is filled with small-scale live steam information, while the U.K.'s Association of 16mm Narrow Gauge Modelers publishes six general live-steam magazines and six newsletters per year.

The Internet is alive with all sorts of information. While there is a lot of good information, sometimes I read things that I know are probably not the best approach or are questionable. There are many model railroading sites that have interactive forums where you can ask questions and get a variety of answers (including our own Steamup.com).

Knowing which information is good advice and which might be shaky can be a problem. Sometimes conversations can get animated as personal opinion might vary on a subject. Read these carefully and if several steamers offer the same advice, then it is probably a valid answer. But also take this into account — where is the steamer from? What works for a steamer in the warmer climates might not apply to those in the colder clime. We do have environmental considerations to think about because we operate outdoors.

Some sites have a fee and some are open to the public but do require registration to keep spammers from attacking the site — because unfortunately, that crowd has nothing else better to do.

Web can help sites: *Our favorite — Steamup.com.*

Here are some sites that I find helpful and enjoyable:

- **Steamup.com:** Steam in the Garden's web site. Forum requires registration to post but is free. If you subscribe to the magazine, your registration comes with bonus features to which non-subscribers do not have access. The forums are devoted to many aspects of small-scale live steam (32- and 45mm-gauge) and the hobby in general.
- **Mylargescale.com:** Open to the public. Forum requires registration to post but is free. There is a paid advanced membership that gives you added benefits. Covers the whole large-scale hobby with 32- and 45mm-gauge steam coverage only in one forum. Forums have moderators who can provide editorial review to keep the information on track.
- **Largescale.com:** Fee site. Access to the forums requires paid membership. Covers the whole large-scale hobby with limited steam coverage in the forums. Forums have moderators who can provide editorial review to keep the information on track.
- **Chaski.org/homemachinist:** Completely devoted to live steam in all scales to include stationary engines. A wealth of information which includes tips on machining. Finding information for a beginner may be daunting since it deals with the larger ride-on scales, but definitely worth a look. There are sub-categories that focus on small-scale live steam.
- **Livesteam.proboards.com:** Primary focus is ride-on. Registration required. Forums have moderators who can provide editorial review to keep the information on track.
- **7-8ths.info:** The "Seven-Eights Lounge" is a discussion site that is more concerned about scale than power, though there are forums for 1:13.3, 1:12, 1:10 and 1:8 scales as well as the 1:13.7-scale locomotives. No fee, includes classifieds, galleries and links.

Many live steamers put up their own experiences in live steam on the Internet via YouTube, Vimeo or the like. You can find these through the search feature of search engines or via the sites' internal search feature.

The majority of the videos are video diaries of what happened at a personal or a public steamup. There are a few instructional videos out there, and you have to remember that the on-camera personality is a hobbyist and production quality might not be up to the standards that you see in professional videos on broadcast TV, but they're having fun and hopefully you will too and will learn a bit as well.

As you can see, live-steam resources come in many flavors. So after you read, watch and find yourself wanting to get a more hands on experience, ultimately, the best advice I can give is to interact with a live steamer to finish your education and then graduate to where you will become a resource for the next generation of live steamers.

National steamups

Steamups with multiple layouts and hundreds of participants have grown over the last two decades. These venues are publicized and there is a registration fee which has a couple of purposes. First, venues usually charge rent and sponsors may have to cover that type of expense as, well as others. Second, water, fuel and sometimes even steam cylinder oil are supplied, as those travelling from a greater distance may not be able to bring their own, so the fee helps to cover those costs.

Whether or not you have a live steamer in hand, attending a steamup is a great way to get started. There are usually lectures or clinics, lots of people running trains, exhibiting suppliers, sometimes a flea-market ("swap table") where a good quality, second-hand steamer can be acquired (the best thing about that is you get a chance to run the locomotive to make sure it works as advertised).

The two large U.S. steamups are the International Small Scale Steamup (http://wwww.Diamondhead.org), held in Diamondhead, Miss., in January and the National Summer Steamup (http://www.SummerSteamup.com), held in suburban Sacramento, in July. These have between 100 and 300 people attending. Additionally, Staver Locomotive, a business in Portland, Ore., holds steamups in the spring and fall, which cater to smaller crowds.

My first steamup was at the first national garden railway convention I attended, and I was just a spectator. In that weekend I learned a lot about steam.

— S.E.McD.

Improvements that could help any locomotive — building a better

Beyer-Garratt

Text and photos by Kendrick Bisset

My Accucraft Beyer-Garratt NGG16 has proven to be a good running engine, and I have enjoyed running it, but a few modifications have helped both running and handling. The following does not describe the order of work actually performed, but in the order it perhaps should have been performed. While these changes apply to the Accucraft Beyer-Garratt, I think some of these ideas at least may apply to other locomotives.

The Garratt is a bit awkward to handle, both to transport and to work on. With two semi-permanent articulation joints, the various segments can flop around when trying to move or invert the engine. With outside frames, it is necessary to invert the engine for oiling. The locomotive comes with a plywood base, but with no means of holding it down to the base once the locomotive is unpacked. Jeff Young presented a locomotive carrier in *Steam in the Garden,* No. 104 (March/April 2009), but I went a little further.

Garratt to go: *Locomotive and carrying case in sling.*

I made a simple (and rather crude) cradle which serves to both hold the engine to the plywood base for transport, and allows the entire locomotive to be turned on its back for servicing and modifications. I mostly used material on hand, so the parts are perhaps not optimal size, but they are functional.

The top (when the loco is upright) is a piece of half-inch plywood, 5¾-inches wide and 26-inches long; a bit longer would have been better. The sides are one-quarter-inch thick, five-layer plywood, three-

— *Continued on Page 27*

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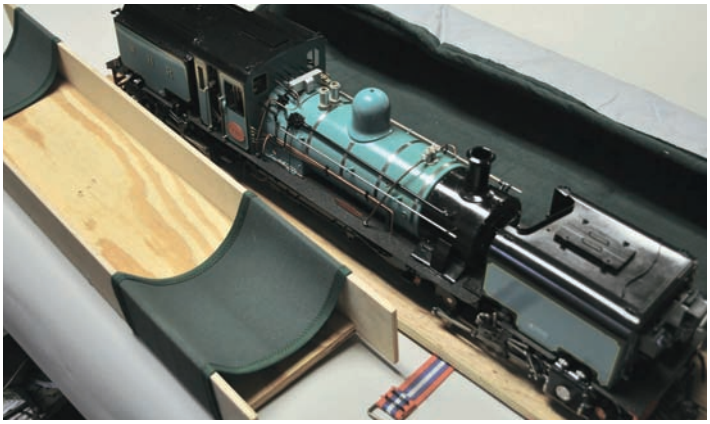
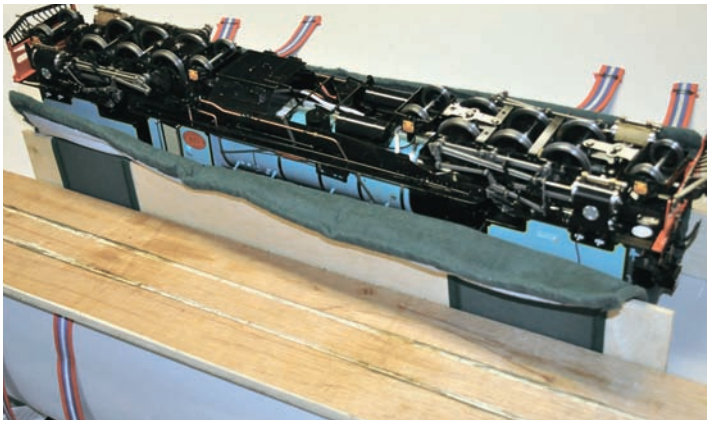




Carrying case: *Left, locomotive right side up on base. Right, Garratt upside down in padded case top.*

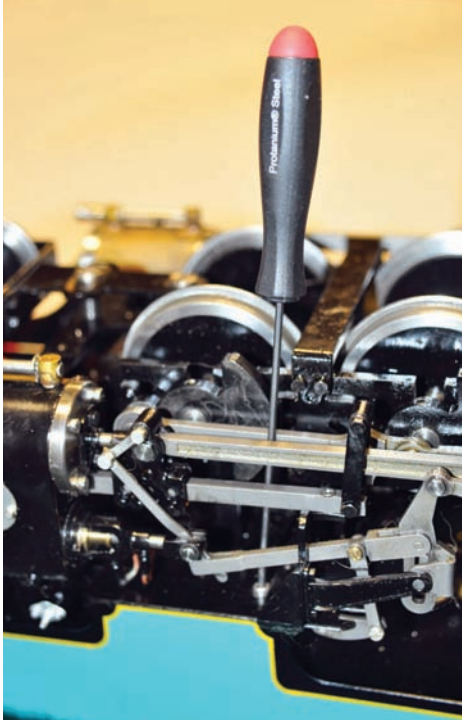
— Continued from Page 23

inches by 30-inches. While it is not really good practice, the sides are glued and screwed to the edges of the top. This makes a square inverted "U" shape.

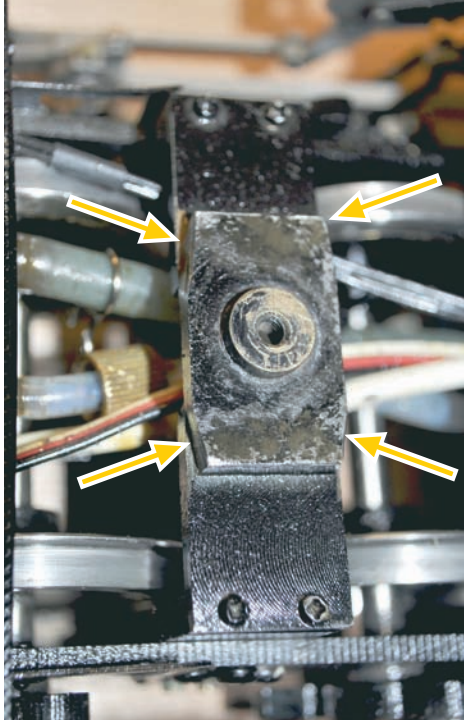
Two canvas slings support the two end units of the engine. These slings are each made to fit over the two tanks on the engine. The rear tank has a breather vent, so the sling is made narrow enough to miss the vent and avoid damage; it is about 4½-inches wide. The sling for the front tank is about six-inches wide.

Rather than turning over the edges, seam binding tape was applied using zigzag stitching to prevent the material from unraveling The two strips were sewn, formed into loops, and held with pins. The lengths could thus be adjusted to provide relatively level support, clear of the smokestack. Once the length was determined, the loops were sewn, again with zigzag stitch. The slings are not fastened to the cradle.

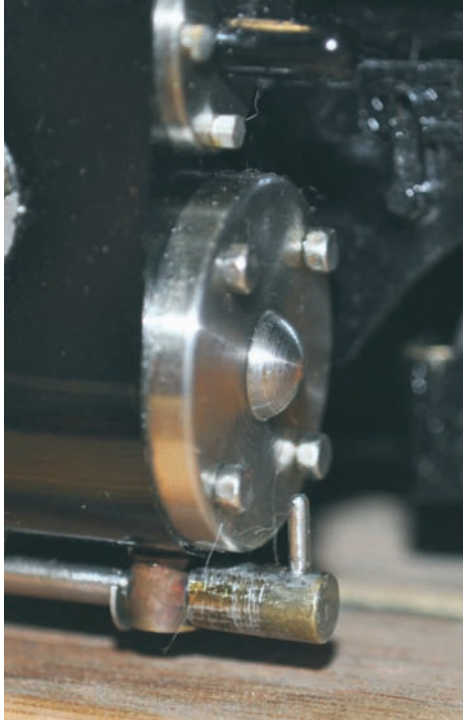
A large pad was made to protect the details and finish. One side is a soft flannel material, and the other uses material made for ironing board covers. The padding is four layers of polyester padding made especially for pot holders, and so can withstand considerable heat. These materials were all found at a chain fabric store. The pad is 14-inches by 29-inches, and so covers the top of locomotive and



Hex: *Changing Phillips screws to hex socket heads for easy access.*



Rounding corners: *Yellow arrows indicate ground down pivots.*



New cylinder handles: *Will now clear the top of the rail.*

extends down the sides a little. The idea was that the pad could be used as a large pot holder to pick up the locomotive when hot, should the need arise. This has not been needed — yet.

The plywood base, locomotive, pad and cradle are held together by four homemade straps. The straps can be pulled tight and are held with strips of hook-and-loop fasteners. When thus assembled, the entire assembly can easily be turned upside down and the straps undone. The base can be lifted off, and the underside of the locomotive is now accessible for oiling or any other work.

The cradle and pad supports the locomotive securely. When the work is finished, the base can be placed back on the locomotive, upside down, and the straps re-applied. The entire assembly can then be turned upright, the straps removed, the cradle and pad removed, and the loco is ready for firing or display. While a bit heavy, the locomotive can be turned over easily by one person.

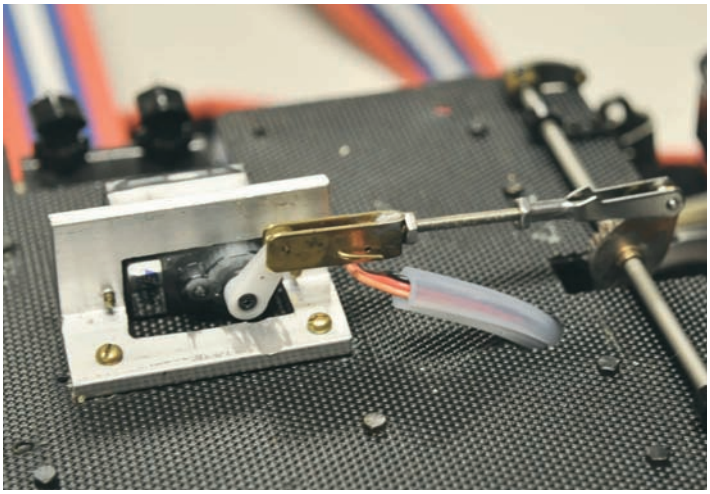
The Garratt is assembled with metric screws, mostly hex head, and some Phillips head. The tanks, in particular, are held with 2mm Phillips head screws inserted up from below. Most of these are hard to access, being obscured by valve gear and rods, lead truck or frame members. A simple improvement is to replace these screws with stainless steel socket head screws, available from Micro Fasteners of Lebanon, N.J.

The typical hex driver is much thinner than the typical Phillips screwdriver, so access is much easier. A better idea is to get — again from Micro Fasteners — a screw-holding hex driver. This makes it easy to insert the screws through the obstructions. The one I use is a 1.5mm ball-end screw holding hex driver, Micro Fasteners BDMH15. The ball end is useful, too, allowing significant misalignment between the screw and the driver. Socket-head screws can be useful in other locations, too; I have replaced the screws holding the rear cab wall with socket heads, making removal of the wall much easier than before.

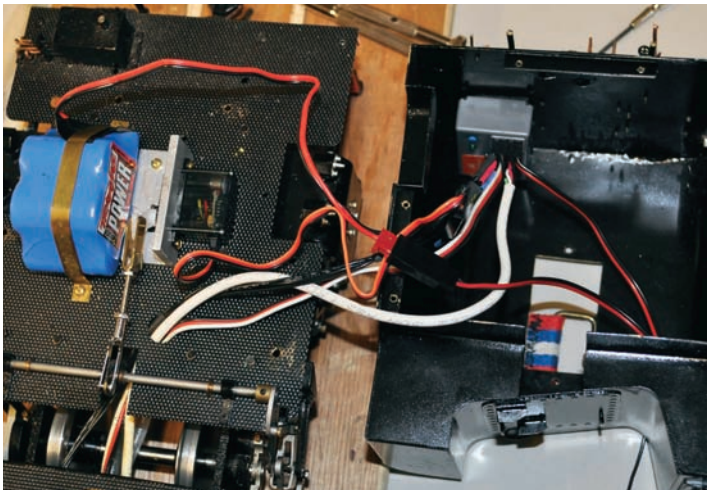
The specifications of the locomotive indicate that it should operate on four-foot radius curves. My railroad has four-foot radius curves, and I found that the front engine would not quite negotiate the curves. Disassembling the pivot (quite a task, made more difficult without the cradle described above), it was apparent that the corners of the pivot assembly on the engine frame had been hitting the boiler front. A little work with a cutoff disc removed the corners, and allowed the front engine to turn freely. The rear engine received similar treatment, although it did not appear that the rear engine had the same difficulty.

The cylinder drain cocks on the Garratt have a handle which projects straight down when the cocks are open. In this position, the handles project below the top of rail, so that operation past a turnout will close the cocks. Replacing the short collar with a longer piece allows the handle to be moved beyond the end of the cylinders.

The original handle and collar are assembled with soft solder, so it is easy to disassemble after removal from the engine. A short brass rod was used to replace the collar, with a hole to fit the rod, and a short piece of wire to lock the rod where the handle had been.



Servo: *Assembly for rear-engine servo. The homemade clevis uses a smaller diameter pin to fit in the servo arm. The brass arm soldered to the brass gear on the reversing shaft is also visible.*



R/C: *Front engine radio control (similar on rear). Receiver is stuck to front wall of tank – first on rear wall, but got too hot, so was moved. Charging connector accessible through removable tank hatch.*

The old handle was installed in the new piece of brass. Now, the handle can be turned straight up to open the drain cocks. Had I thought a bit further, I would not have used brass, but an insulating material (heat resistant, of course), which would have made it easier to close the drains without singeing the fingers!

I found that the lubricator drain valve has a slight leak. The original insert has O rings, but there is nothing to prevent water from leaking around between the O rings. This allows some of the water to drain, and thus reduce the amount of oil fed to the cylinders. I replaced the brass valve insert with a hard Teflon rod, turned slightly large to make a tight fit. I first tried a new brass insert, but I was not able to make a tight enough fit to prevent leaks.

The Teflon rod started leaking after a few steamings, so I abandoned the lubricator drain idea. The drain hole is a bit too big for a full 2-56 tap, but since it can take a fairly long screw, I thought it would do. A small fiber washer (Kadee?) provides a nice gasket. I now drain the lubricator using a fine plastic pipette from the local hobby store. Further operation reveals that the lubricator is a bit generous in the amount of oil used; I have removed the plug, and allow the lubricator to leak, in the hopes that there won't be quite so much oil passing up the stack.

Installation of radio control allowed removal of the "steering wheel" reverse control. Since my railroad was "out and back" with only about 100-feet of track, I need to reverse the locomotives frequently, especially when I run around the train without use of the 0-5-0 switcher (my hand, pushing the cars).

The radio control installation proved to be quite a task, involving machining several brackets to mount the servos. There are now two reversing servos, both operating from one channel. Space is tight under the rear tank, so the reversing servo assembly must be no more than about one-half-inch high. I used a smaller-sized servo, and made the bracket to mount the servo against the "foot plate." A brass arm was fabricated and soldered to the gear on the rocker shaft for connection to the servo. I made the front servo assembly first, even though there is much greater clearance, so I could verify that the assembly would clear under the rear tank. It was indeed low enough (about one-half-inch), so I simply (ha!) duplicated the assembly for the rear tank.

The Accucraft design has one engine's radius rod raised and the other lowered when running. While the earlier Garratts used this convention (both engine units could be built the same), this is a model of the last Garratt production, and by then the reversing gear was arranged to have both radius rods up (for "reverse") or down (for "forward"). With independent servos (carefully aligned for correct operation), this could be corrected. On one engine, I loosened the eccentric (which is simply clamped on the crank pin) and changed the angle. I do not remember which engine required the change.

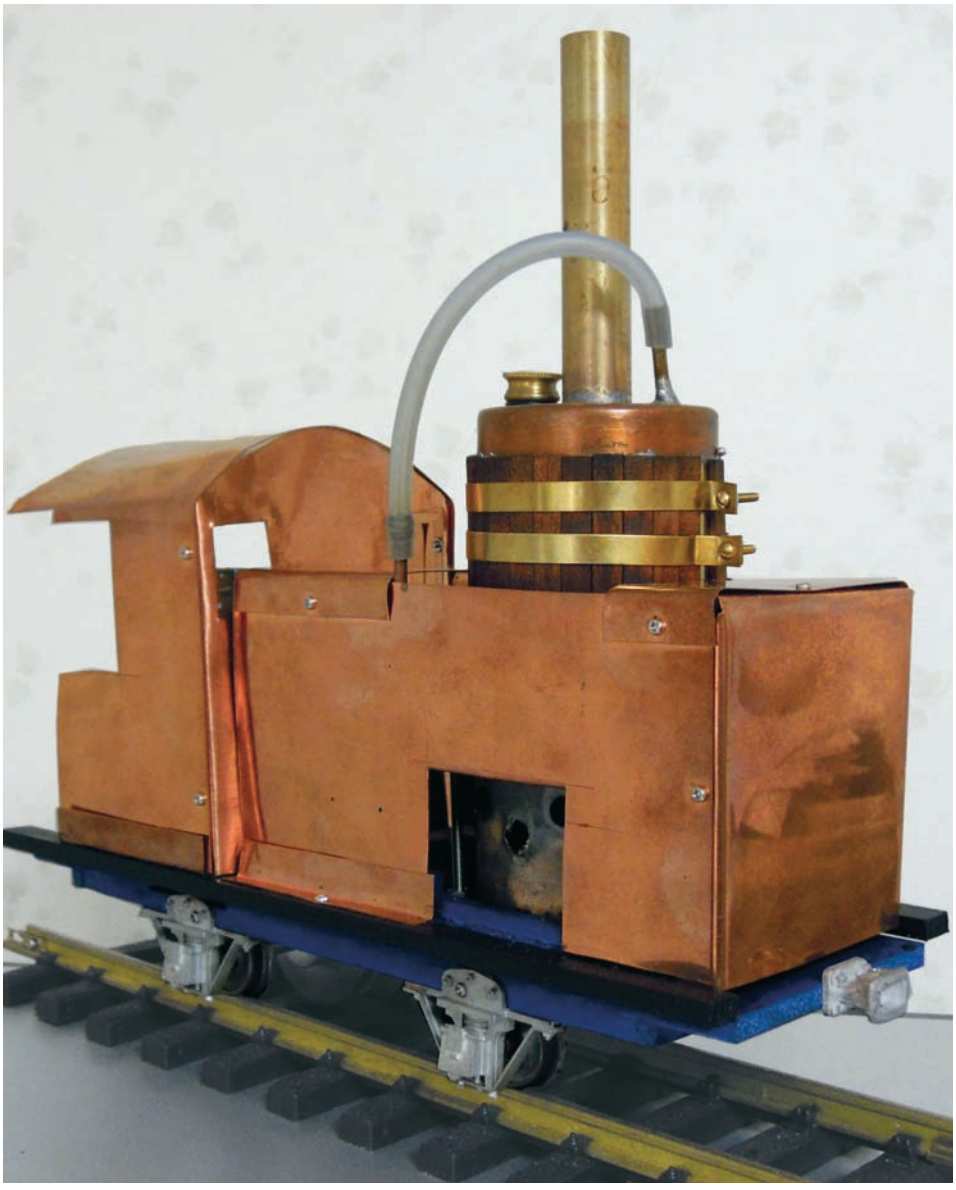
With the removal of the mechanical reversing gear, the locomotive apparently became more flexible. The eccentric on the front engine contacted the boiler frame when traversing curves. A portion of the tapered frame was removed to increase clearance.

To wrap up, that change in the Garratt design was apparently not understood by everyone at the Beyer, Peacock Gorton Foundry, where most of the prototypes were built. A possibly apocryphal story has it that a locomotive fresh from the shop floor and being tested tried to go both directions at once!

A Japanese live steamer with few resources fulfills a dream of building his own locomotive with

HAND TOOLS

Text and photos by Kazuo Kumamoto

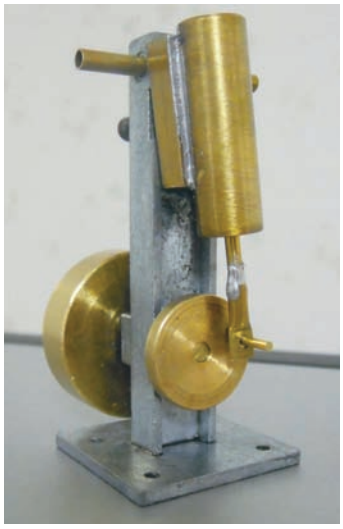


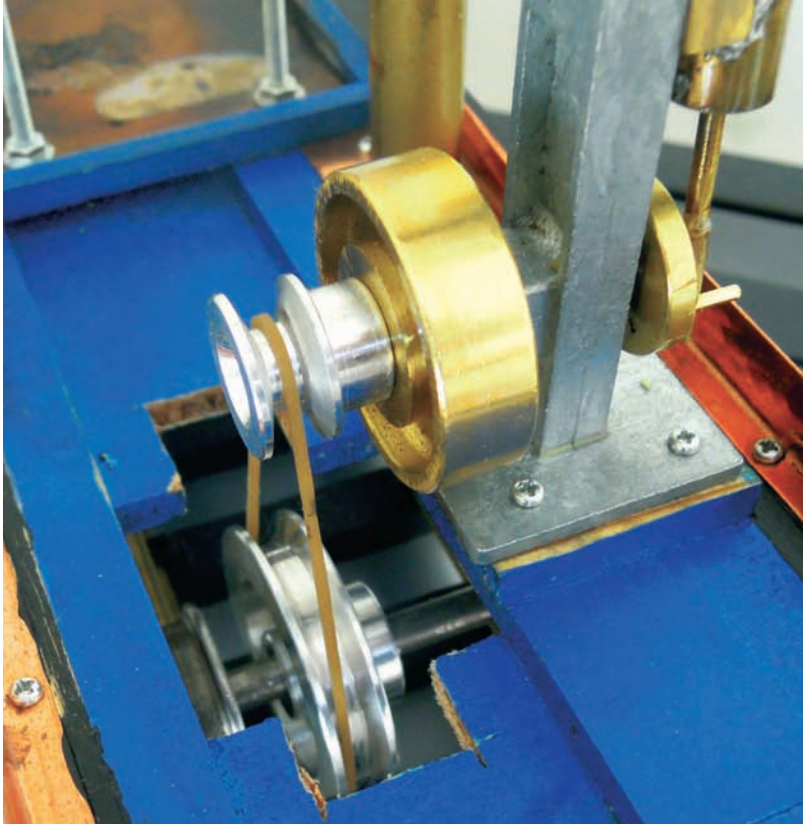
Completed dream: *Kazuo's loco with its copper-clad cabin.*

For most of my life I have had an deep interest in live steam and in recent years have enjoyed running an Accucraft "Ruby." But that wasn't enough — I began to dream about building wonderful steam locomotives with my own hands. But I don't have much experience in construction nor the machine tools necessary for scratch building. How, I wondered, could I realize my dream?

On the other hand, the market is full of a variety of live-steam locos and even in this magazine there are reports of advanced building by many experienced live steamers. But for beginners or inexperienced hobbyists like me, many must have my dream as well. I finally hit upon a method to build a live-steam loco with my limited skills and tools and decided to document how I put it together, using a commercial steam engine and ordinary tools and materials. Although the finished loco is very tiny, I'm so pleased with the results it could never be replaced by anything larger or fancier.

(It was only after constructing my locomotive and writing this article did I learn of Mike Martin's "Basic Project Engine," a remarkably simi-





Boiler, motor & rubber band: *Left and center, Midwest Products' boiler and single-cylinder motor. Right, the motor attached to the drive axel with properly sized pulleys and a rubber band.*

lar loco first created in the 1990s. I was surprised to read about Mike's efforts at http://www.panyo.com/project — obviously great minds think alike.)

A few years ago, I purchased a "Ruby" kit from Accucraft Trains Co. in the United States and for the first time entered the live-steam world. I assembled it according to the construction manual, yet I encountered difficulties. After much trial and error operating the "Ruby," I finally had the great pleasure of successfully running it on my small oval Gauge One track. I learned a lot of things about how to drive the loco and also the mechanism of the locomotive.

Building dream

As I wondered earlier, how could I realize my scratch-building dream? First of all, I decided to buy the boiler and steam motor itself as a kit, a chassis could then be made of wood that had pulleys to transmit the torque of the steam motor to the driving-wheel axle.

For the steam motor, I selected an oscillating type because I thought that the oscillating engine unit could be easily assembled and operated for a beginner. In experimenting, I found that the loco could not run without a lubricator, so the lubricator was installed between a boiler and the engine unit.

I obtained the steam engine unit from Midwest Products Co. Inc. of Hobart, Ind., which consisted of a single-cylinder oscillating engine unit and a vertical boiler. The engine unit and the boiler were assembled following the construction manual. It was easy for me to build the engine unit, but it took a lot of time and effort to assemble the boiler, and finally it had no leaks. When the engine unit was tried, steam blew out of a small gap between the valve face and the flat face of a spacer in the main frame. Polishing the valve face with No. 400 wet-dry sandpaper fixed this leak.

As the boiler is vertical type and has a smokestack, I decided to place it in the front area of the chassis and therefore the oscillating engine unit was set in the rear area of it. The lubricator was placed in the middle area of the chassis.

The chassis was designed with two wheel sets using journals and couplers, which were attached to the front and rear chassis; these parts

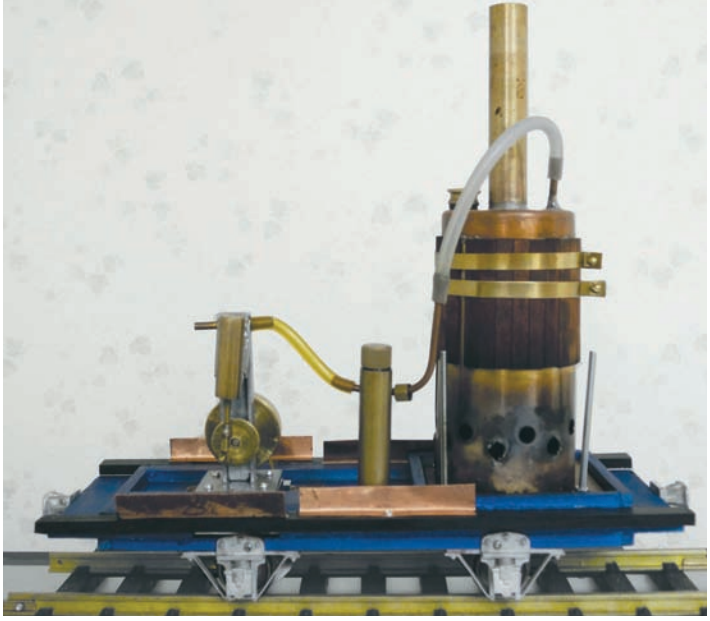
Logging locos

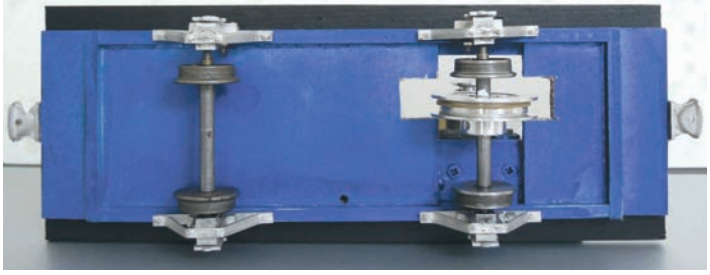
A three-part series that follows hobbyists in their builds of what are sometimes called "backwoods locomotives." All the projects share vertical boilers, 0-4-0 wheel configurations and somewhat similar final looks, but they are as different as possible.

➡ **Part One — Hand tools in Japan.** A live steamer with few resources designs a single-cylinder scratch-built effort using a boiler kit, ingenuity and some understanding of physics.

• **Part Two — Ben builds a boiler.** A father-and-son team take a school winter vacation to scratch-build a pair of logging locomotives using machine-shop tools.

• **Part Three — To the Max.** A live steamer who has no experience in locomotive building confronts a lack of tools and a lack of multilingual skills to expand his railroading horizons.





Finished: *Left, the completed loco with motor, oiler and boiler. Above, the undercarriage, showing the large pulley on the rear axel.*

were purchased from Ozark Miniatures Inc. of Cedar City, Utah. Then two things needed to be done: first, to determine a reduction ratio, and second, to figure out how to connect the two pulleys.

Reduction ratio

Here is a theoretical explanation of how gearing ratios work, explained in simple terms. The reduction ratio (R) is defined by the diameter of the pulley on the axle of driving wheels (Dw), which is divided by one on the driving shaft of the engine unit (De).

R=Dw/De

The torque of the driving wheels' axle (Tw) is represented as the product of the torque of the driving shaft in the engine unit (Te) and the reduction ratio and the efficiency of transmission (ET), which is defined as how the torque of the driving shaft in the engine unit can be efficiently transmitted to the driving wheels' axle. The maximum value of ET is one.

Tw=Te_R_ET

Therefore, it is necessary that the amount of the reduction ratio should be increased and ET also should be approached to the amount of one, if the torque of the axle in the driving wheels is desired to be increased.

Pulley wheels made of aluminum were obtained at a hobby shop. When I started experimenting with the reduction ratio, I first used a single rubber band to connect the pulleys, which were of the same diameter, eight millimeters or 5/16-inch (R=1.0).

Although the driving wheels rotated well without load, the loco did not move when placed on the tracks. This meant that there was not enough torque on the driving wheels' axle to move the loco. Then I tried a pulley on the driving wheels' axle that had a diameter as large as possible within the vertical distance between the axle and the ties on the tracks.

This distance was about 21mm (13/16-inch), so the diameter of the pulley on the axle needed to be 33mm (1⅜-inch), which resulted in the pulley not hitting the track ties. This set of pulleys (De=8mm, Dw=33mm) with the reduction ratio of 4:1 successfully made the loco move well.

Rubber bands

There are a variety of ways to potentially connect the pulleys: belts, rubber bands or chains. For this project, I experimented with commercially available rubber bands. I tried different numbers of bands — from one to three or five — to get the maximum transmission efficiency. I found the best torque came from a single rubber band, but was surprised, because the tension of the single rubber band was not that much greater than multiple bands.

I then made a cab of copper to cover the oscillating engine unit. Both the boiler and the lubricator were also wrapped with a copper box.

At this step, I tried a practice run of the loco. I used the solid fuel Esbit, available here in Japan in mountain-climbing equipment stores. I added a little machine oil around the moving parts of the cylinder and on the valve face. As the engine moved around the track, it often stopped along the way. I decided it was stopping because I was using machine oil rather than real steam-cylinder oil.

Since it's well known that a live-steam loco needs a lubricator, I thought maybe adding one would help. I bought a lubricator from Accucraft Trains and added it between the boiler and the motor with silicon tubing.

As expected, after adding the lubricator, the motor began running without a hitch. When the loco was fed with 12 grams of solid fuel, 50cc of water and one cubic centimeter of steam oil (about a half ounce of fuel, about 1¾-ounces of water and three-one-hundredths ounces of oil), it would run for about 10 minutes with the mean speed of 31 meters (about 100 feet) per minute. When the loco was running successfully at a moderate speed on the oval Gauge One track, I found the scene impressive and I was gratified that everything worked.

My long-cherished wishes had been fulfilled. Although it is a small, simple live-steam loco, it is an irreplaceable gem to me. This loco taught me that if one perseveres, a dream can come true. Making good use of this experience, I have now resolved to build a "real" live-steam loco within the next three years.

A new locomotive that does not disappoint: Accucraft's first 7/8ths-inch scale, American-profile

'EMMA'

Text and photos by Dave Frediani

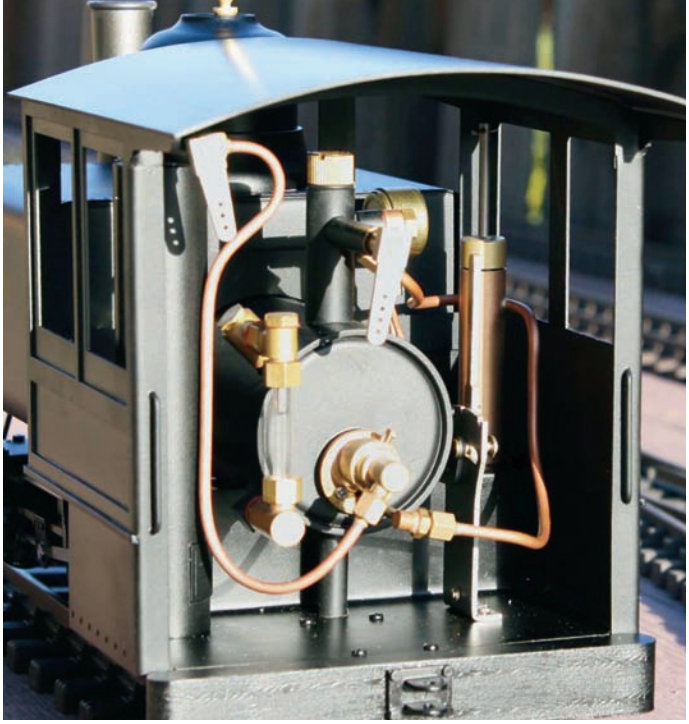
Stately 'Emma': *A recently delivered 'Emma' sits proudly on the author's Sonora, Calif., backyard railroad.*

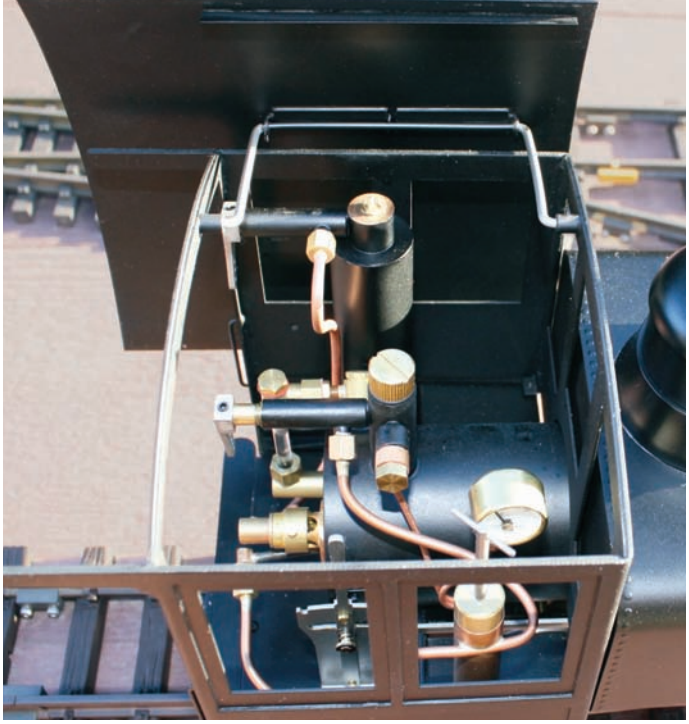
I never thought I would be interested in 7/8ths-inch scale, but after seeing Accucraft Trains Co.'s "Emma" at the National Summer Steamup in Sacramento in July 2012, I was hooked and I knew I had to have one.

Placing my order for an "Emma" at the Sacramento steamup, I patiently waited for nine long months and it finally arrived in March 2013.

The locomotive came in a standard cardboard box lined in Styrofoam with the usual packing material. To my surprise there was an additional unique wooden crate with "Accucraft" stamped across its top.

The "Emma" is a prototype of an 0-4-0ST Brooks Locomotive built in 1886. Around the turn of the





Controls: *Left, the back head on 'Emma.' Right, another view of the controls, with the roof off.*

century, Brooks Locomotive Co. of Dunkirk, N.Y., and other locomotive makers merged to became the American Locomotive Co., known as Alco.

The engine has a great design and not a lot of detail, which makes it easy to handle. You don't have to worry about small parts being damaged when you're transporting the engine from one location to another. Accucraft's workmanship and paint is exceptional. I was not disappointed.

I was surprised how stable the locomotive is. It's not top heavy at all, given the fact it runs on 45mm track. Accucraft provided two syringes, one for the lubricator and one for the boiler. Also included were two wrenches, an extra sight-glass tube and a six-page instruction manual.

Now that it's out of the box, it's time to test it.

First I oiled all moving parts. Then I added steam oil to the lubricator, being careful not to fill above the steam pipe. Then I filled the boiler with water. I found it difficult to fill without the use of a Goodall valve (not supplied with the engine). In order to fill the boiler to the maximum you should put the syringe tube to the bottom of the boiler and fill slowly. The boiler will hold 240ml of water after removing 30ml for expansion. If you try to fill it too fast, it will only hold 150ml of water; air seems to get trapped in the boiler somehow.

Next came the fueling, which went well. The gas valve, water valve and lubricator are accessible because of the size of the cab, which also makes for easy access to the throttle, reversing lever and gas control. The latter three could be easily fitted with a radio control system given their locations and the ample room available.

There is also a burn slider to adjust the flame if needed as well as a pressure gauge.

The saddle tanks can easily be removed by unscrewing the dummy cap, in front of the steam dome, which also reveals the safety valve that blows off at 60 psi, making it easy to kit bash or alter its appearance.

Now firing it up – I placed the engine on rollers for the first firing.

The firing was easy and the flame flashed into the back of the fire tube quickly. It took about 10 minutes for the

Accucraft 'Emma'

- **Loco type:** Based on Brooks Locomotive Works 0-4-0, saddle tanks, 30-inch gauge, bituminous coal-fired, circa 1886. Cylinders: eight-inch diameter, 14-inch stroke. Drive wheels: 28-inches. Weight: 20,000 lbs.
- **Scale:** 1:13.7, 45mm gauge.
- **Length:** 12.9 inches (326mm).
- **Width:** 5.4 inches (137mm).
- **Height:** Seven inches (180mm).
- **Boiler:** Single-flue. Pressure: 60 psi. Capacity: 240ml (8.1 oz.).
- **Fuel:** Butane.
- **Min. radius:** Four feet.
- **Cylinders:** Two D-valves.
- **Valve gear:** Simulated Stephenson.
- **Fittings:** Safety valve, throttle, filler plug, pressure gauge, water glass, superheater, displacement lubricator.
- **Available models:** Black; lettered and unlettered.
- **MSRP:** $995.

Seven-eighths superiority?

What's all the sudden interest in 7/8ths-inch scale? Well, to the hundreds who've been modeling 30-inch gauge railways on 45mm-gauge track (or 24-inch railways on 32mm track) for decades, the question is, "What took you guys so long?"

Accucraft Trains Co. of Union City, Calif., has now announced three 1:13.7-scale locomotives ("Emma" now being delivered and an 0-4-0ST Quarry Hunslet and the 0-4-2 Baldwin "Fairymead" expected within months), and that brings the scale into focus.

But 13 years ago, modeler Kevin Schindler of Fortuna, Calif., wrote an article for his local garden railway society newsletter (reprinted in *Steam in the Garden*) extolling the virtues of 1:13.7-scale railroading, where one foot of prototype is built as 7/8ths of an inch in the model (in 1:20.3-scale, one foot of the prototype is about 19/32nds of an inch in the model, while in 1:32-scale, one prototype foot is a model's three-eighths of an inch) .

"In 7/8ths-inch scale, rich character and charm can be appropriately captured," Kevin wrote. He also said, "The simplicity and quaintness of a light railway can be easily rendered in a small backyard."

Size matters: *Texas 7/8ths-inch scale modeler Carl Malone has already lettered his 'Emma' for his railroad and added details such as window frames, wooden cab frame and a bell. Carl posed a 7/8ths-inch scale figure next to 'Emma' to help show the large size of the locomotive. Photo by Carl Malone.*

Noting that many of the short-wheel based 30-inch or 24-inch gauge locomotives can navigate a 23-foot radius curve — which is a 20⅛-inch curve at 1:13.7 scale — Kevin wrote, "Face it, most of us don't have the room for the 10-foot to 12-foot-plus radius curves required to make a larger locomotive look 'right' in our small settings."

Kevin didn't address the fact that 1:13.7-scale equipment is 20 percent bigger than 1:20.3-scale equipment, meaning details are easier to attach (and for weak eyes, easier to see).

Seven-eighths-inch modeling has heretofore pretty much been the province of the scratch builder or the kit basher, as ready-to-run locomotives and rolling stock in the scale have been hard to come by. Now, with at least three live-steam locomotives having arrived or are on the near horizon, 1:13.7-scale is available to the masses.

And, it should be noted, Kevin continues to model in 1:13.7-scale to this day, though he was recently seen operating a 1:20.3-scale locomotive at a steamup.

— dc

pressure gauge to begin to rise. Within 12 minutes it had reached 40 psi and it was ready to go.

I opened the throttle valve about one-eighth of a turn then moved the Johnson bar back and forth, three or four times, to clear the water from the cylinders and away it went. The throttle and speed were easily controllable. The engine runs just as well forward as it does in reverse.

The first roller run was only 10 minutes long, because I didn't trust the water level shown in the sight glass. Then I added a Goodall valve so water could be added as needed. The second run ran for about 30 minutes and I had the ability to add water as needed. I would check the sight glass every five minutes and add water every 10 minutes as a safety measure. The third run was for 44 minutes – checking the water every 20 minutes and adding water when needed.

Now it's on to the track: On the first run the engine tended to pick up a little speed until the fuel tank warmed. I only experienced this when the engine was cold.

The engine is incredibly powerful. On this first run, it ran for 40 minutes.

On its next run, I added five 1:13.7-scale box cars.

A train: *'Emma' pulls a load of 1:13.7-scale box cars the author built in anticipation of the loco's delivery.*

The "Emma" ran just as well pulling the five box cars as it did by itself. After stopping the engine, I added three more cars and there was no difference in pulling power, perhaps a little slow to start, but it ran smooth at all speeds. Finally I stopped it again to add my last box car and the engine pulled all nine cars with ease – slow to start yet running smooth.

If I had more 1:13.7-scale cars I think it would have pulled at least 12 effortlessly. On the last run the "Emma" ran for 45 minutes – Accucraft's instruction manual said it would run out of fuel before it would run out of water and that's absolutely true.

In the 45 minutes of running there was no need to add water. Now I understand why Accucraft didn't feel the need for a Goodall valve. At the end of the run there was still a good one-quarter-inch of water in the sight glass.

After about three hours of run time, it still ran flawlessly. I see no reason to change anything on this locomotive.

Of all the locomotives I own, I rank the "Emma" one of the easiest and best-running engines. I highly recommend the "Emma" for the experienced steamer or a newcomer to live steam.

Hat's off to Accucraft.

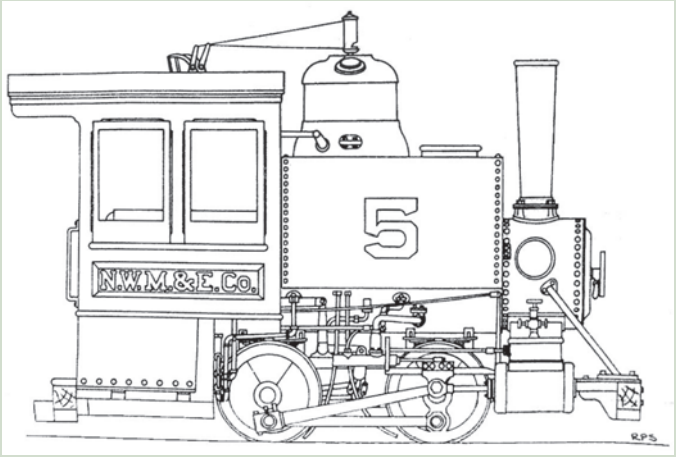
1886 loco, by way of 1975

Though Accucraft Trains Co. shrouds locomotive development in a certain amount of mystery (as is its right), those in the know said the new "Emma" was based on an 0-4-0ST from Brooks Locomotive Co. of Dunkirk, N.Y. Further, the whispers said, this locomotive was detailed in *Narrow Gauge & Shortline Gazette* in 1975.

A quick email to Bob Brown, owner and editor and publisher of that magazine, confirmed a contributor had provided drawings and photos of a Brooks 30-inch-gauger in March 1975 (which, it turns out, was the magazine's first issue).

Bob sent a photocopy of the page in question. Contributor Richard Schulenberg had borrowed a copy of what was thought to be a circa-1900 edition of a Brooks sales catalog, made copies of two photos in the book and then made composite drawings from the locomotives in the photos.

The pictures show Nos. 4 and 5, 0-4-0 locos with saddle tanks, each lettered with "NWM&E Co." Quick research indicates in the 1880s there was a company called Northwest Mining & Exchange Co. in northwest Pennsylvania, which mined coal in Jefferson and Clearfield counties. Thirty-inch gauge would be appropriate for coal-mine railroad.



'Emma's' mom: *A 1975 drawing made by Richard Schulenberg may well be the basis for Accucraft's newest locomotive. Reprinted with permission.*

While whole copies of *NG&SLG* still exist, the "mechanicals" (as magazine pre-press material was called in those days) are lost to the ages, so the original drawings and photos are gone.

Technology allowed a copy of Schulenberg's drawing to be reproduced here, with Bob's permission.

— dc

A simple modification to ease life's frustrations: How to make 'Emma's' safety valve more

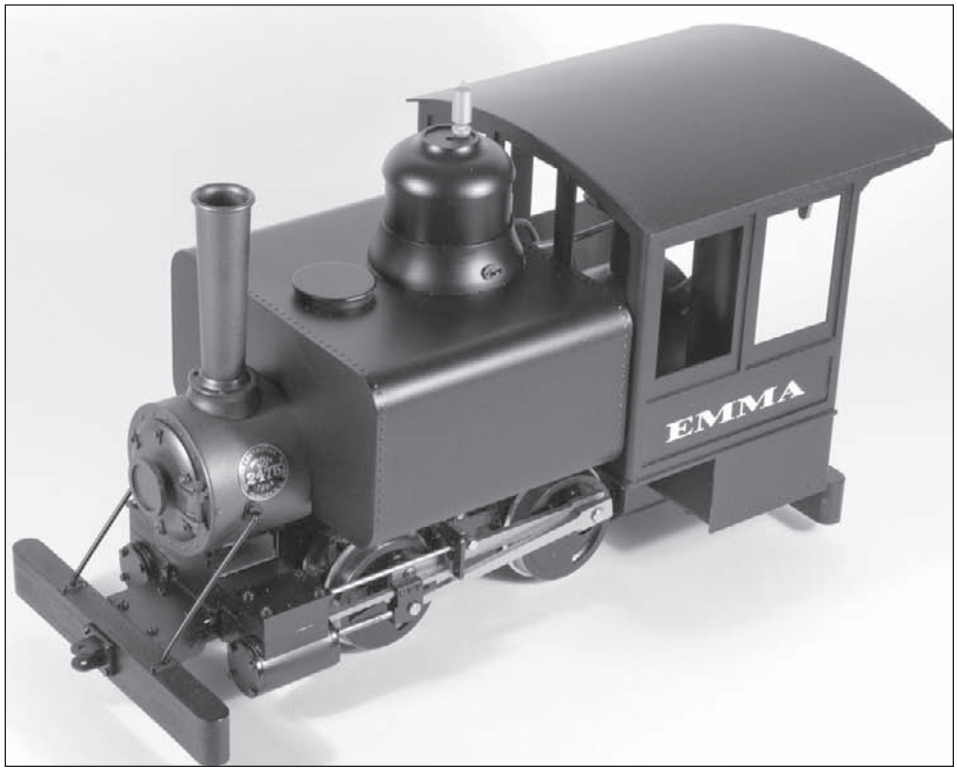
Accessible

Text and photos by Marc Horovitz

It's always nice to have a locomotive's safety valve easily accessible so that you can tweak it with pliers to see if there's any pressure or give it a tap with a finger in case it gets stuck open.

Accucraft's new 7/8-inch-scale "Emma," a wonderful locomotive in all other ways, has the flaw of concealing its safety valve under a steam dome that is not easily removable. Not only is this inconvenient when one wants to get at the safety, I found that water gets trapped between the dome and the tank and messes up the paint.

This modification was performed on an early production "Emma." Subsequent models have screw-off domes that leave the dome base still attached to the saddle tank. The base hampers access if you wish to remove the safety valve, so this modification may still be of use. Also, unscrewing a hot dome is trickier than just being able to slide it off. If you undertake this project, take accurate measurements, as they'll probably differ from mine.



'Emma's' dome: *A look at the top of the new locomotive.*

The dome is integral with the big, rectangular saddle tank. To remove them, you must unscrew the dummy water hatch in the top of the tank (Photo 2, see Page 38). The tank and dome will then lift off (Photo 3), exposing the safety valve perched atop its stem. If you look inside the removed tank (Photo 4), you'll see that the dome is attached to the tank with a pair of screws from the underside. These screws can be easily removed and the dome separated from the tank (Photo 5).

The dome is made of aluminum with a recess on the inside. This recess is larger in diameter than the safe-

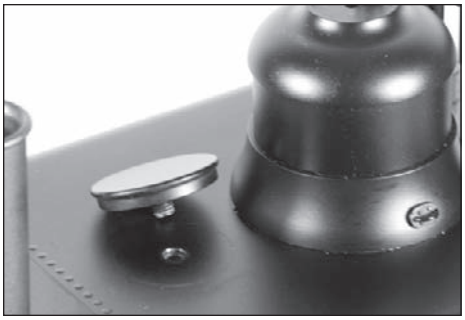


Photo 2

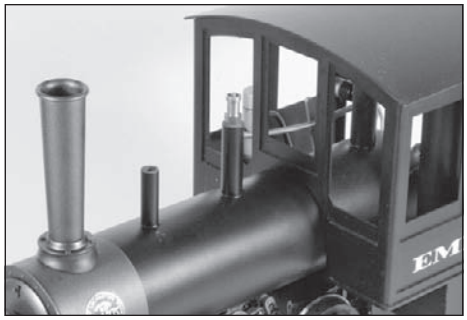


Photo 3

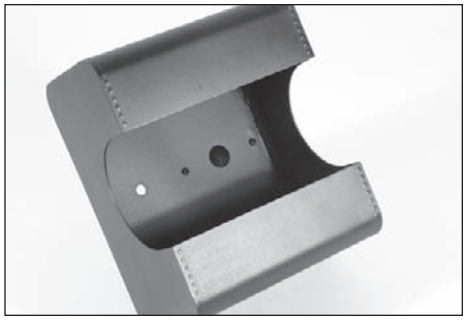


Photo 4

Photo 5

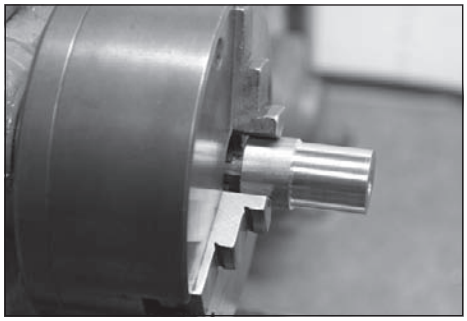


Photo 6

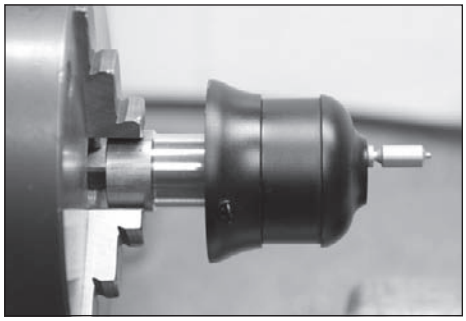


Photo 7

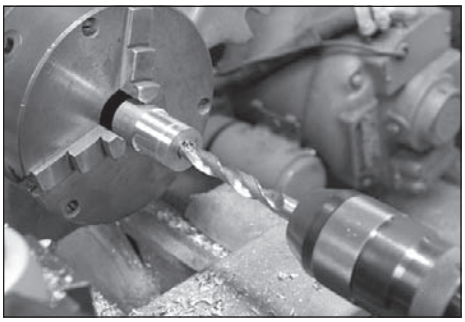


Photo 8

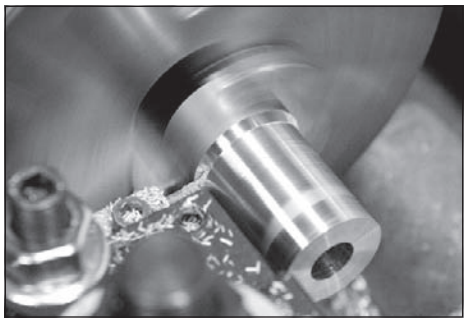


Photo 9

Photo 10

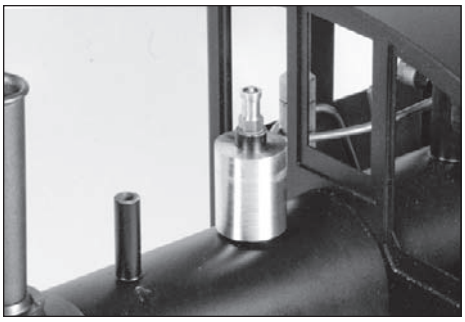


Photo 11

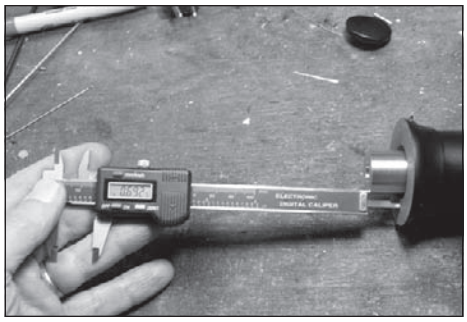


Photo 12

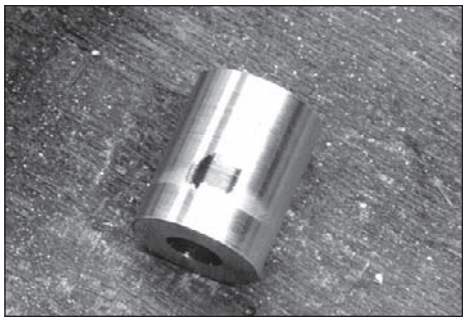


Photo 13

ty-valve stem. The simple solution was to machine up a plug to become part of the dome that would enable the dome to slip over the safety-valve stem.

I measured the diameter of the recess inside the dome. On my engine, it was around .610-inch, but check your engine — it could be different. I also found that the recess was slightly tapered.

I chucked up a piece of one-inch brass in the lathe and turned it down to .610-inch (Photo 6). With the dome temporarily in place on the end of the turned plug (Photo 7), I made sure there was about five-eights-inch of the turned piece beyond (to the left) of the dome.

The safety-valve body is 10mm in diameter. I don't have metric drills that size, so I used an X-size drill to drill through the plug (Photo 8). Make sure you drill at a nice, slow speed. Once the hole was through, I parted the piece off (Photo 9). The plug at this stage can be seen in Photo 10. I tried it on over the safety-valve body for size and it fit just right (Photo 11).

I temporarily put the plug back in the dome and measured the amount protruding (Photo 12). I then marked that distance from the end of the plug. Although it's a

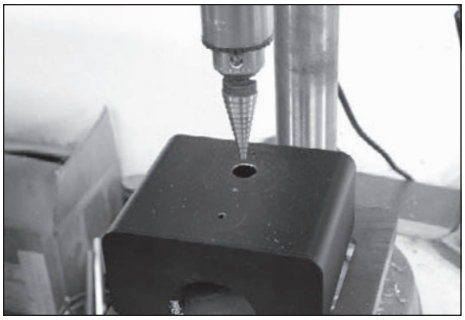


Photo 14

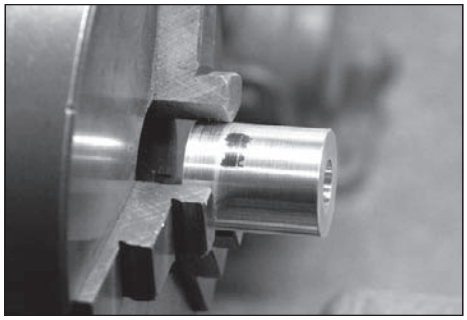


Photo 15

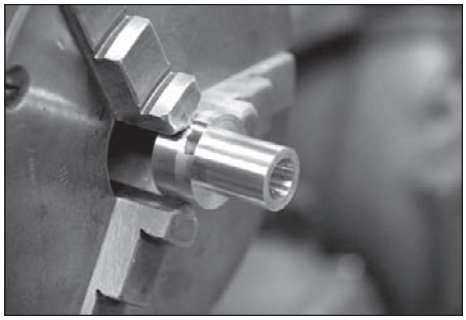


Photo 16

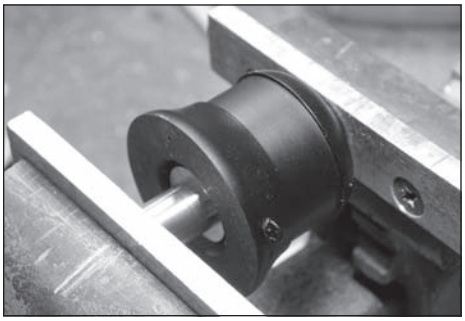


Photo 17

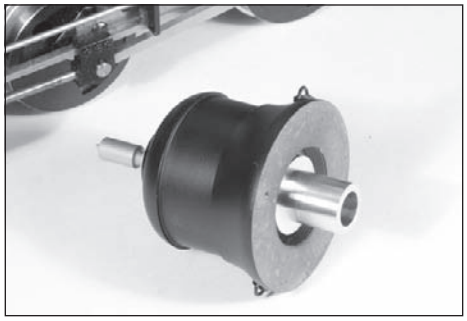


Photo 18

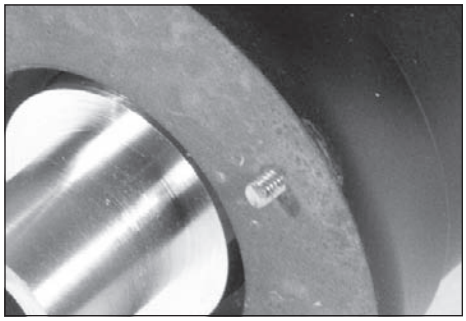


Photo 19

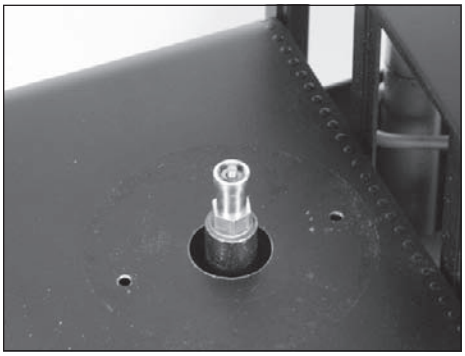


Photo 20

Photo 21

Photo 22

little difficult to see, there is a scribed line in the darker area on the side of the plug in Photo 13.

The hole in the saddle tank for the safety-valve stem is .467-inch. It needed to be bigger for my purposes. Using a step drill in the drill press, I opened the hole out to .625-inch (Photo 14).

Then I re-chucked the plug in the lathe by the short end, using the mark I had made for reference (Photo 15). I turned the diameter to .600-inch up to the mark (Photo 16). That finished the plug.

The next thing to do was to press the plug into the dome. It needed to go in pretty straight, so I did it in the vise after I removed the dummy whistle (Photo 17). It doesn't need to be pressed in hard — just enough to stay securely. Because the recess into which the plug was being pressed was tapered slightly, I pressed it until it felt right — that's the best I can tell you. Photo 18 shows the dome/plug assembly.

The job was nearly finished. However, the dome needed to sit properly in place and not rotate around the safety valve. I was not happy leaving that to chance. There needed to be a way to register the dome so there was only one way it could go on.

To do that, I used one of the screw holes (it doesn't matter which one). The screw from the hole was too short and I didn't have any longer metric screws of the right size to replace it, so I simply ran a 2-56 tap into the hole, right over the existing threads. Yes, I know this is a nasty bit of metal work, so please don't write in. Desperate times call for desperate measures.

I screwed a 2-56 screw tightly into the newly tapped hole. Then, with a cut-off disc in my rotary tool (Dremel), I trimmed it, leaving about one-eighth-inch proud (Photo 19).

Photo 20 shows the tank back in place with the safety-valve protruding through the enlarged hole in the tank. The modified dome now slips into place over the stem (Photo 21), the threaded stud registering it in the former screw hole.

With the dome in place (Photo 22), "Emma" looks the same as before surgery — only now the dome can be slipped off in a second and the safety given a tweak.

DIAMONDHEAD

JANUARY 12 to 19 2014

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Important contacts

Patrick Darby
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k5pat@bellsouth.net

Richard Jacobs
Manager
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trainmax@yahoo.com

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Proposed 2014 activity:
A trip to New Orleans to see Southern Pacific No. 745
(Photo courtesy Phil LaRosa)

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

TIMETABLE

July 17-21, 2013 — National Summer Steamup, Lions Gate Hotel, McClellan, Calif. New venue for steam hall; nine air-conditioned layouts, more than a dozen loops of 45mm and 32mm tracks. Saturday-night BBQ dinner, clinics and workshops, a dealer room and swap tables. Info: http://www.summersteamup.com/ or email steamup@summersteamup.com or call (650) 898-7878. Lions Gate Hotel, (866) 866-7100.

Aug. 28-31, 2013 — 33rd Narrow Gauge Convention, Hilton Hotel, Pasadena, Calif. Info: http://www.33rdnngc.com.

Aug. 30-Sept. 2, 2013 — Labor Day Weekend Steamup, Pennsylvania Live Steamers, Collegeville, Pa. Two-hundred-nineteen-foot dual-tracked Gauge One loop, plus 24-foot by 54-foot portable layout with dual tracks, gauged 45mm and 32mm. Info: http://www.palivesteamers.org.

Sept. 7-9, 2013 — Fall Meet (open to public), Pioneer Valley Live Steamers, Southwick, Mass. Info: http://www.pvls.org.

Sept. 8, 2013 — Houston Area "G" Gaugers at the Houston Area Live Steamers, Hockley, Texas. Garden railroad club meets at Zube Park for a Gauge One steamup. Info: http://www.houstonagg.com.

Sept. 19-22, 2013 — Fall Steamup, Staver Locomotive, Portland, Ore. Info: http://www.staverlocomotive.com.

Nov. 29, 2013 — Gauge One Turkey Trot, Pennsylvania Live Steamers, Collegeville, Pa. Info: http://www.palivesteamers.org.

Jan. 12-19, 2014 — International Small Scale Steamup and Arts Festival, Diamondhead Inn and Suites, Diamondhead, Miss. Info: Patrick Darby, k5pat@bellsouth.net, (985) 867-8695; http://www.diamondhead.org. Diamondhead Inn & Suites: (228) 255-1300.

Feb. 15-17, 2014 — 17th Annual Presidents' Day Steamup, Electric City Trolley Station & Museum, Scranton, Pa. Info: wrunloco@aol.com or call Clem O'Jevich (570) 735-5570.

Regular steamups

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.

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

Puget Sound Garden Railway Society. Two steamups per month, one at the Georgetown Powerplant in Seattle on the second Saturday and a steamup at a member's track on the fourth Saturday. Info: http://psgrs.org/livesteamtimetable.html.

On the Brink Live Steamers: Weekly Wednesday, and occasional weekend, Sacramento, Calif., steamups on elevated live-steam only tracks at two locations. Info: Paul Brink (916) 635-1559, paulbr@aol.com.

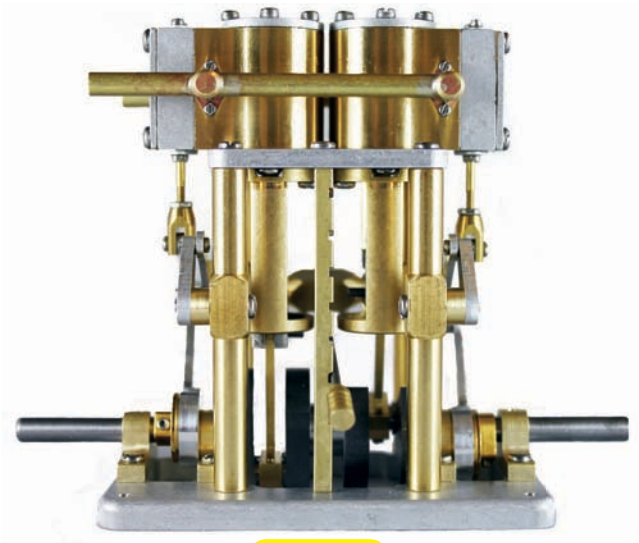
Southern California Steamers: Contact Jim Gabelich for dates, places and other pertinent information. (310) 373-3096. jfgabelich@msn.com.

Upstate N.Y. Steamers. Several steamups per year in various locations around Western New York. Info: http://www.tinyurl.com/upstatesteamers.

Pacific Coast Live Steamers: Irregularly scheduled backyard steamups, mostly in S.F. Bay Area. Info: http://www.p-c-l-s.org.

Advertiser index

Fully Machined Steam Engine Kits



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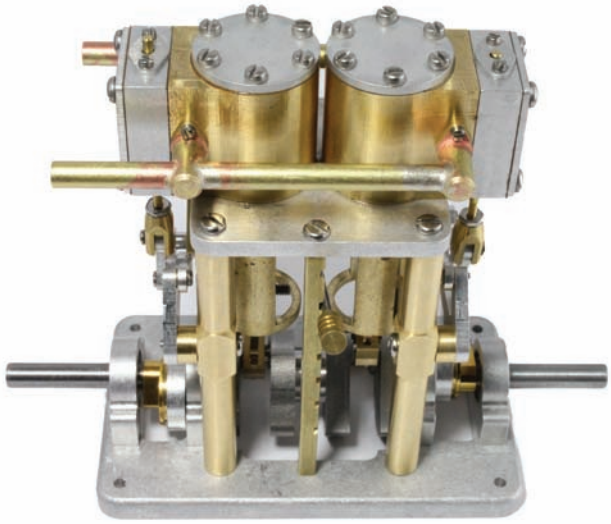

TVR1ABB

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1 3/4" DIA (5 Spoke)

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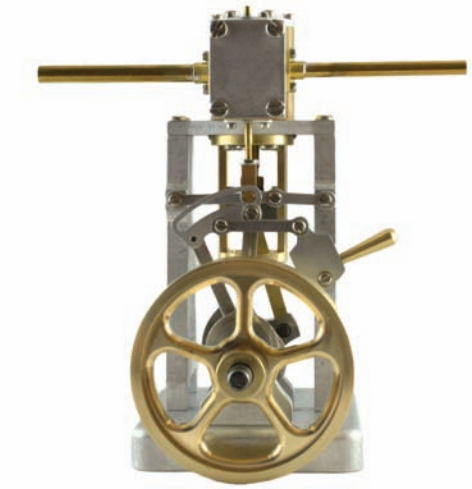
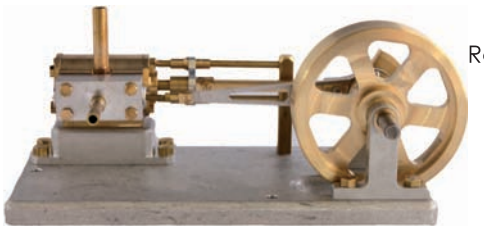
1 3/4" DIA (6 Spoke)





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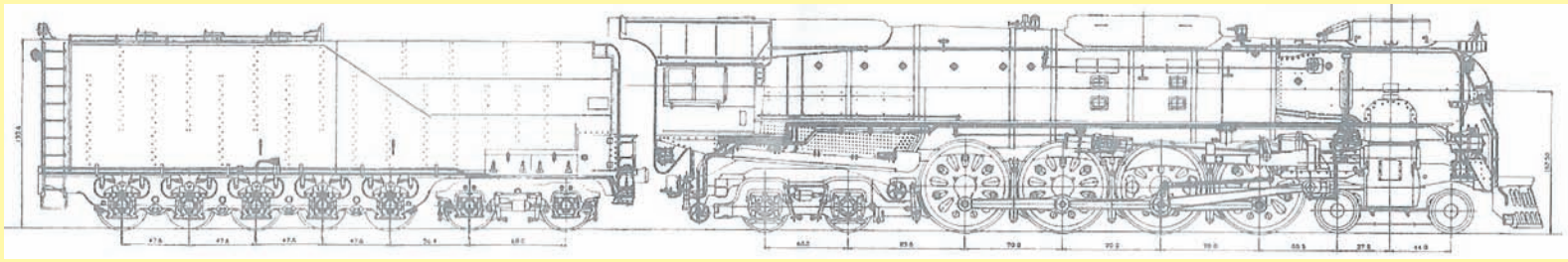
Union Pacific FEF 3 #844, the next U.S. prototype locomotive, now in development

Projected for late 2014 release, this famous locomotive will be made available in black and gray livery.



Next British locomotive announcement

The British Railways Merchant Navy Class "Clan Line 35028" is now under development. Projected date of release is late 2013. No further details are available at this time.

Great Northern S2 #2584

This superb-performing 4-8-4 is still available in glacier green livery as shown; RTR and black has sold out.

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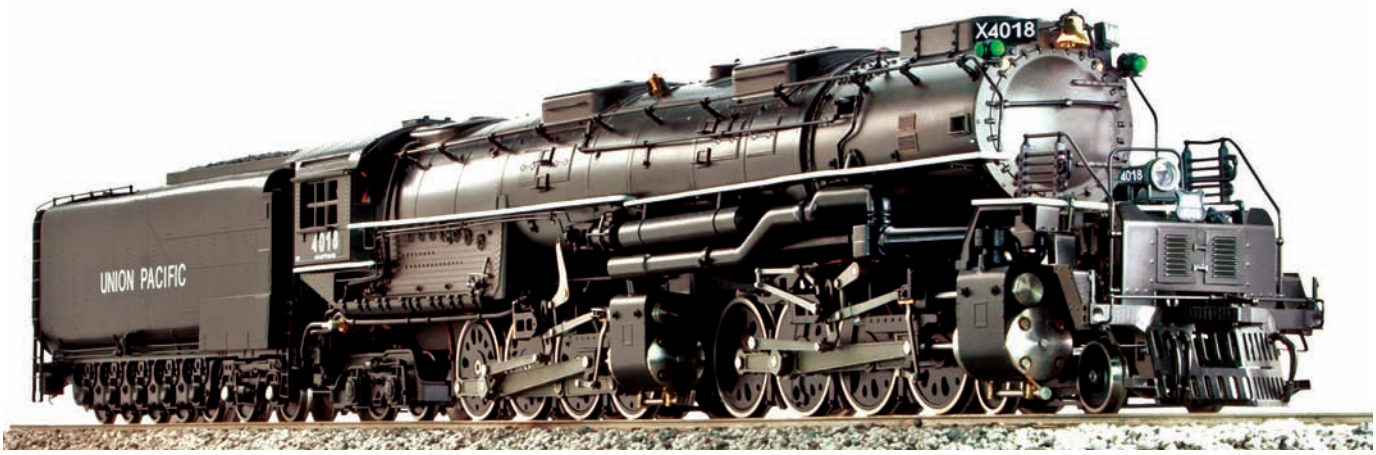

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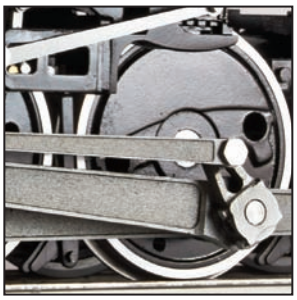

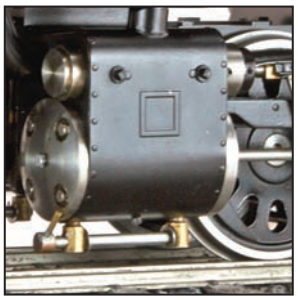

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