No. 139, May/June 2015 $5.95

STEAM IN THE GARDEN

STEAMING AMONGST THE MAGNOLIAS

HAVING FUN AT THE INTERNATIONAL SMALL-SCALE STEAMUP

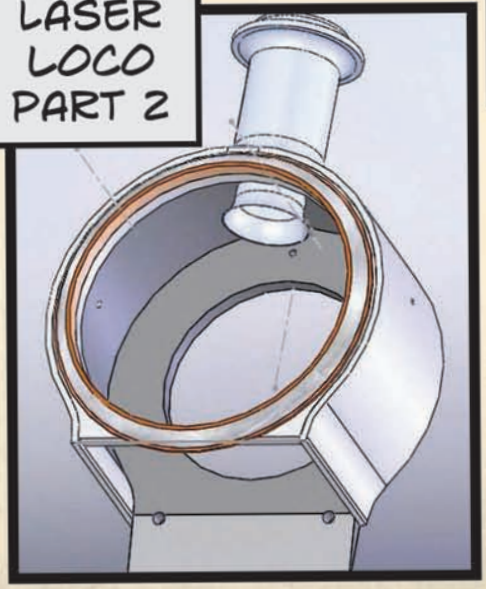
CHUFF!

CHUFF!

ALSO INSIDE:

NEW MATERIAL FOR WICKS

LASER LOCO PART 2



OPEN CAB 'DORA'

AML

AMERICAN MAINLINE
1:29TH SCALE

Art Knapp TRAINS

4391 King George Blvd. Surrey B.C. Canada

1-604-596-9201

ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

Your Number 1 Source for Live Steam models in Canada

$1,299.99

G721-02 B&O 0-4-0 Live Steam

$2,099.97

AC77-422 RGS#11 Live Steam

$1,199.97

1:13.7 Scale Live Steam

AC77-501 0-4-0 Unlettered

AC77-010 RUBY 1 LS
$589.99

AC77-020 RUBY 3 Ida
$589.99

AC77-012 RUBY 2 DELUXE
$599.99

AC77-011 RUBY 1 KIT
$499.99

AC77-051 UNDEC. FORNEY $799.99

Royal Hudson Live Steam Butane
1:32 Scale As running today
$3,999.97

L&B 2-6-2T LEW
Live Steam 1:19" Scale $2,549.97

AC77-211 Mich/Cal #5
3 Cylinder Shay Live Steam Butane $2,349.97

Accucraft Electric Brass Models

AC78-520 D&RGW #50
List $757.00 Sale $589.97

AC78-514 Plymouth Switcher
List $757.00 Sale $589.97

AC78-138 RGS Gosse #4
$729.97 ea.

G931-07 0-6-0 $799.97
Canadian National
Electric Switcher 1:29" Scale

AML ROLLING STOCK PS1 Box Cars

List $139.99
Sale $89.97 ea

Plastic body, diecast trucks and metal wheels
Operating sliding doors, underbody detail,
See thru walkways and ladder detail

Roads Available
CN, CP, SP&S, GN RED, GTW,
BC RAIL, ONT/NOR, GN BROWN

E-Mail To: info@canadagscaletrains.com

Coming Soon $129.00

1:29" Scale Bethgon Coal Porters
CP Red or Black Special Run For Canada
Only 100 of each car Produced

Code 250 #6 Switch Right/Left
$144.99 ea

All Prices in Canadian Funds
For Exchange Rate Go To xe.com

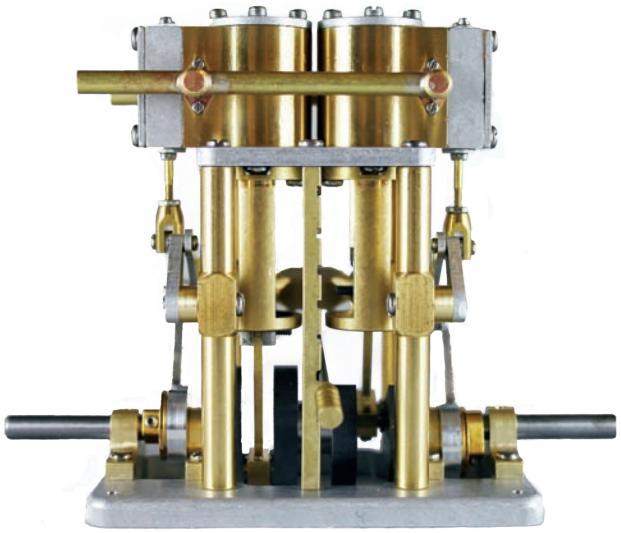
AML Stock Car
$54.97 ea.

$94.97

Woodsided Reefer
CN , CP 1:29" Scale

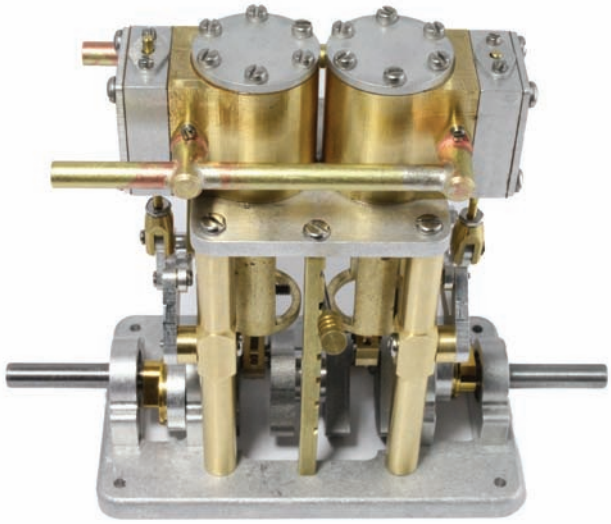
Fax Order To: 604-596-9240

Fully Machined Steam Engine Kits



TVR1A

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



TVR1ABB

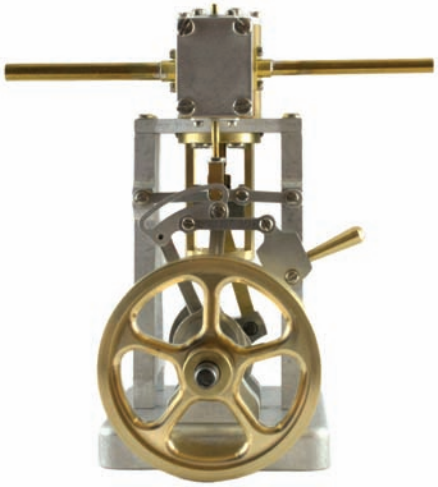
Ready to assemble steam engine kit: $295
Fully assembled and tested: $400
Includes all hardware
SAME AS TVR1A but with shielded ball bearings
Includes full-color assembly manual
Dimensions: Same as TVR1A
Weight: 323 g

Flywheels for TVR1A / TVR1ABB

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

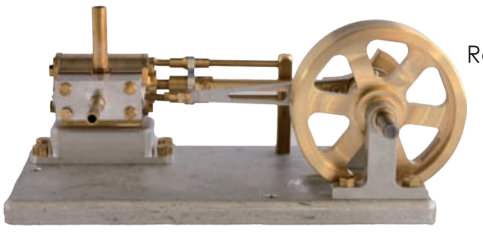
BFLY1: $25
1 3/4" DIA (5 Spoke)

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



VR1A

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



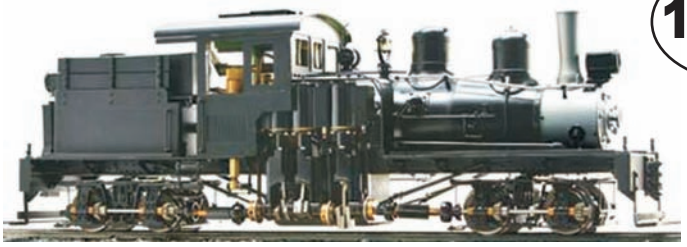
HM1

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

VISA MasterCard American Express Cards DISCOVER PayPal

Graham Industries PO Box 15230 Rio Rancho, NM 87174
FAX (505) 715-4527
Order online at: www.grahamind.com
As always, shipping in the USA is FREE! (USPS Priority Mail)

1:20.3



3' Gauge 28 Ton 3 Cylinder SHAY

WEST SIDE LUMBER HEISLER #3

Logging disconnects

DORA FREELANCE 0-4-0

Long and short logging cars

Steam oil
&
Lubricating oils

GREEN VELVET
Steam Oil

Jackson & Sharp
Coaches
Combines

Summerlands
Chuffers

7/8 Scale 1:13.7 EMMA 0-4-0

Pre-Order
D&RGW C-25 Coal Fired
AL87-120C BLACK UNLETTERED
AL87-121C #375 BLACK w/ FLYING RIO GRANDE
AL87-122C #375 GREEN BOILER w/ MOFFAT

We will pay CASH for your trains or put them on consignment

BUY SELL TRADE
CONTACT US!

Are you looking at downsizing?
Do you have trains you don't use anymore?

We are always looking to puchase collections.

Silver State Trains

702-361-2295 702-595-5318 **Email marksstrains@aol.com**

Silver State Trains

www.silverstatetrains.com

702-361-2295

1:32-scale STREAMLINED PASSENGER CARS
Baggage car, Coach, Diner, Sleeper car
Observation car

UNLETTERED, SOUTHERN PACIFIC, UNION PACIFIC, NEW YORK CENTRAL, PENNSYLVANIA, NORFOLK & WESTERN

32

1:32 scale

Own and run a piece of history

2-6-6-6 Allegheny, at 7500 hp, one of the heaviest and most powerful locomotives ever built.
It's a simple articulated locomotive.
The debate as to which is the largest steam locomotive ever built goes on to this day.
It's always been between Union Pacific's Big Boy and the C&O Allegheny!
The figures of weight and size are bounced around by who ever happens to feel the need!

AL97-411 EARLY VERSION IN 1941 C&O #1601
AL97-413 LATE VERSION IN 1948 C&O #1647
AL97-415 VIRGINIAN #900

Butane gas fired
Four cylinders, D-valve, Baker valve gear,
Double safety valve, Axle water pump,
Hand operated water pump in tender,
Water drain valve, Water level glass, Super heater,
Pressure gauge, Adjustable hydrostatic lubricator

Accucraft
brass cabooses

AL97-101 PENNSYLVANIA T1 4-4-4-4 ALCOHOL

32

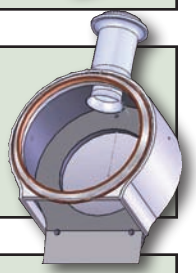
1:32 scale

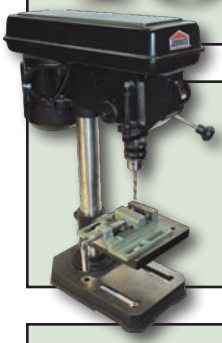
AL97-201 SP Unlettered M-6 2-6-0

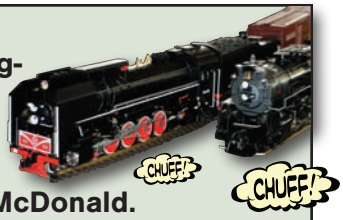
Vol. 25, No. 3; Issue No. 139; May/June 2015

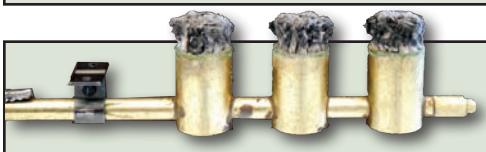
STEAM IN THE GARDEN

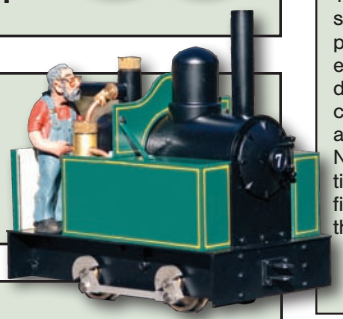
Gather friends, while we inquire,
into trains, propelled by fire ...











Cover: Wuhu Bowande Qian Jin-class 2-10-2 paces an Accucraft USRA 0-6-0 on a Diamondhead layout in the top photo. Bottom left is a new wick material, bottom middle is the laser loco's smoke box and bottom right is a 'Dora' makeover. **Images by Scott E. McDonald, Will Lindley, Keith Bucklitch and Marc Horovitz.**

Editor ..... **Dave Cole**
dmcole@steamup.com
(650) 898-7878, Fax: (650) 475-8479

Advertising Manager ..... **Sonny Wizelman**
ads@steamup.com
(310) 558-4872

Circulation Manager ..... **Marie Brown**
circ@steamup.com
(607) 642-8119, Fax: (253) 323-2125

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

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

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

Steam in the Garden LLC
A Utah corporation

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

Marie Brown, Dave Cole, Scott McDonald, Paul Scheasley, Sonny Wizelman

Editorial: P.O. Box 719
Pacifica, Calif. 94044-0719 USA

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

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

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

http://www.steamup.com/

Also inside:

LATEST WAYBILL

Swiss, U.S. locomotives on the way

Locomotives from the turn-of-the-20th-century on both sides of the Atlantic have been announced by The Train Department. The Hazlet, N.J., company, which represents Regner Steam and Railway Engineering GbR, said the German firm would make a G 2/3+2/2 Mallet in 1:22.5 scale, while Accucraft Co. would be building a 1:32-scale Pennsylvania Railroad E6 Atlantic-type locomotive to The Train Department's specifications, both in 45mm gauge.

The Regner is a kit of a tank locomotive built by the Swiss Locomotive and Machine Works of Winterthur in the late 19th century for the Rhaetian Railway (RhB), a meter-gauge railroad headquartered in Chur, Graubünden, Switzerland which serves almost all of the Graubünden canton (state). The RhB continues to operate to a number of Swiss resort towns including St. Moritz and Davos and crosses the Italian border to serve Tirano, today with an all-electric roster.

No. 25, an outside-frame Mallet design with four compound cylinders, ran on the RhB until 1920-1921, when a shortage of coal and a preponderance of electrification made it obsolete. The locomotive was then sold to a railway in Madagascar and operated there until 1951, when it was scrapped.

(The wheel arrangement designation of G 2/3+2/2 is unique to Swiss railroading and describes axles rather than wheels, the way the Whyte notation does. The "G" stands for narrow gauge, while "2/3" means two drive axles and three total axles — the leading truck — the "2/2" means two drive axles and two total axles and the plus sign indicates the Mallet configuration.)

Swiss Mallet: *Regner is taking orders for a 1:22.5-scale kit of a 2/3 + 2/2 locomotive used on the Rhaetian Railway during the early 20th Century.*

Regner's model will be 18 5/16-inches long over buffers, 4½-inches wide and 6 9/16-inches tall (465mm by 115mm by 167mm) and will weigh 10.6 pounds (4.8kg). The two high-pressure cylinders will be 9/16-inches in diameter (14mm), while the two low-pressure cylinders will be seven-eighths inches (22mm); all have a 13/16-inch stroke (20mm), are lined with Teflon and have drain cocks.

No. 25's boiler, holding 12.85 fluid ounces (380ml), will be gas-fired with multiple tubes; there will also be an oversized gas tank in the locomotive. An axle pump is included in the kit as well as a pressure gauge 13/64-inches in diameter (5mm).

The locomotive will feature a real Walschaert piston-valve system and have an option to run as simple

Pennsylvania Atlantic: *Builders' shot of the PRR E6 4-4-2. Photo: WikipediaCommons/public domain.*

or compounding for startups and cylinder clearing. No. 25 will have sprung axle bearings, Teflon-lined journals and electrically insulated wheels. Minimum operating radius will be two meters (78¾ inches).

Regner says the kit will include parts that are "suitably prepared," with threads cut, boiler soldered and tested, and blackened or painted, "ready for assembly." Options will include radio control, a steam whistle and a Ronson filler valve for the gas tank.

The Train Department said No. 25's price will be $4225, with pre-orders taken through the summer.

The PRR 4-4-2, The Train Department said, will be a "heavy" Atlantic and will be offered in both black and green-lined livery. The black engine will be No. 460, while the green-lined one will be No. 1794. The model will be offered in either alcohol or butane (ceramic burner) variations. Both versions will include slide-valve cylinders and have drain cocks and both a hand and axle pump.

The Train Department said it is taking reservations for Fall delivery of the PRR E6; the alcohol version will be $3000, while the butane will be $3200.

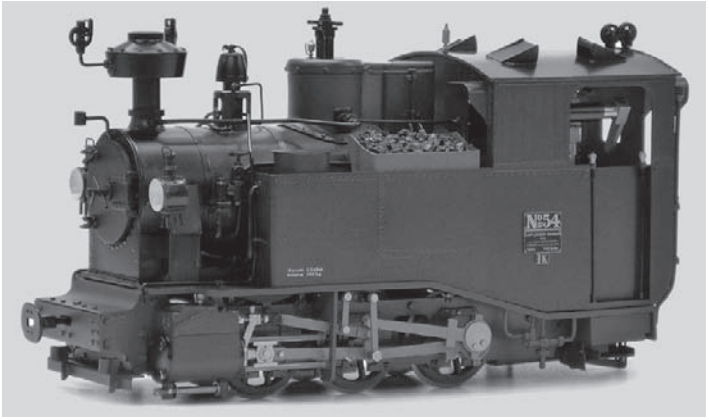
Regner, of Aurach, Bavaria, is on the Web at http://www.regner-dampftechnik.de or by phone at 49-9804-17, while The Train Department's web site is http://www.thetraindepartment.com and by phone at (732) 770-9625 and Accucraft's site is http://www.accucraft.com and its phone is (510) 324-3399.

New version of the Saxonian

Accucraft Co. and its European dealer MBV Schug are building a new 0-6-0 tank locomotive in 1:20.3 scale that is a miniature reproduction of a full-scale reproduction. The Saxonian IK No. 54 was built between 2006-2009 using donated time, money and materials valued at €800,000 (about $1.15 million in 2015 U.S. dollars) using original drawings as well as modern manufacturing methods at the Meiningen Steam Locomotive Works in Germany.

The IK No. 54 now operates on a regular schedule on the Saxon Steam Railway Route, a tourist excursion line in Dresden, Germany.

No. 54 is based on a three-coupled tank locomotive design of which 44 were made by the Saxon Machine Factory in Chemnitz between 1881 and 1920. The locomotives were used not only in Ger-



German tank: *Next up for MBV Schug is a 1:20.3-scale 0-6-0 locomotive that is a model of an engine built in 2006 from 1900 plans, Royal Saxon No. 54.*

many but five were sent to Poland as reparations for World War I and two were sent there after World War II. The last of them were scrapped in 1964.

The model, made of brass and stainless steel, will feature a butane-fired boiler, with safety valve, pressure gauge, a water glass and cylinder drain cocks.

The Saxonian No. 54 will be 10⅞-inches long, 3 11/16-inches wide and 5 3/16-inches tall and will operate on a minimum radius of four feet.

This new model is a complete redesign from the Saxonian No. 50 that Schug and Accucraft made in

G Scale Junction

570 Hebron Rd. Heath, OH 43055
800-311-9448 740-967-7300
HOURS: Tues.- Fri. 11:30 - 6 Eastern Time Sat. 12:00 - 4
and by Appointment
sales@gscalejunction.com

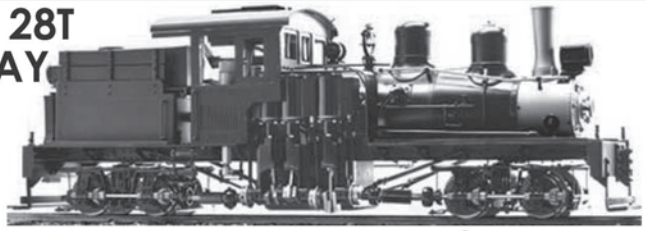
GIFT CERTIFICATES AVAILABLE

Where large scale comes together!

Please check our website for more great offers!
gscalejunction.com

Low Prices - Low Shipping Prices - Personal Service - International Orders Welcome

3' GAUGE 28T
3-CYL. SHAY
$2250
NEW!
1/20.3



RUBY #5 w/ PRESSURE GAUGE 0-4-0 - $509.95
EMMA 0-4-0 -$989.00
NEW D&RGW K-37 - $5859
PLANTATION 0-4-2 - $829

1/32 SCALE C&O CABOOSE-$439.95

ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

1/32 SCALE

NEW N&W J-CLASS #611 - $5649
NEW ALLEGHENY 2-6-6-6 -$6849
CP T-1c 2-10-4 SELKIRK#5935-$5895

PLEASE CALL FOR PRE-ORDERS OR IF YOU DON'T SEE IT ON OUR WEB SITE

AMS 1/20.3 & 1/32 ROLLING STOCK

C&O
OR
VIRG

NEW 1/32 HOPPER $104.50

PRE-ORDER YOUR NEW 1/32 SCALE STREAMLINE PASSENGER CARS

PASSENGER CARS - $293.95

AMS
TRUE TO SCALE

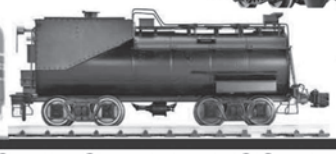
LOGGING DISCONNECTS $64.50

AML

6' FLEX TRACK (12 PC): ALUMINUM - $191.00 BRASS- $395

1/29 LIVE STEAM LOCO'S & ROLLING STOCK

NEW DREYFUS HUDSON $3615
ELECTRIC $3269
W/ SOUND $3615



NEW L.S. USRA 0-6-0 W/
VANDERBILT TENDER $1169
VANDERBILT TENDER $599

CODE 250 & 332 ALUMINUM, BRASS, & STAINLESS TRACK - AML, AMS, PIKO, LGB, ARISTO-CRAFT, USA TRAINS, SUNSET VALLEY, LLAGAS CRK, MICRO-ENGINEERING

Spectrum

1:20.3 FREIGHT CARS IN STOCK

PIKO

Kadee

BACHMANN

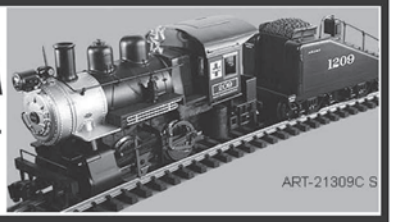
LGB

USA TRAINS

HARTLAND LOCOMOTIVE WORKS HLW La Porte, Indiana

ARISTO CRAFT TRAINS

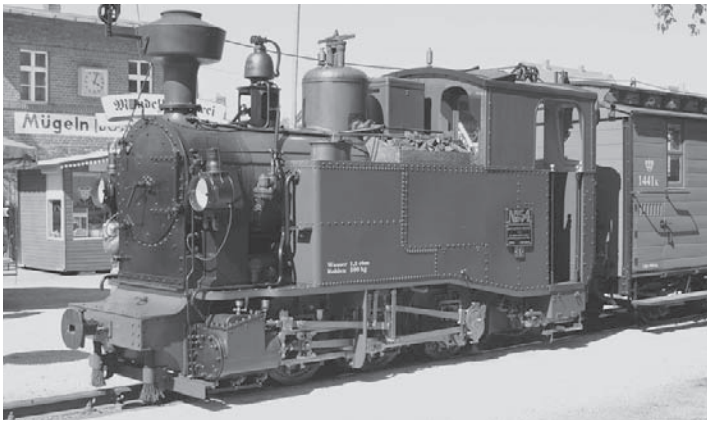
ARISTO-CRAFT
1/29 LIVE STEAM
0-4-0 RADIO CONTROL
UNDEC - DRGW - ATSF
& PENNSY ONLY-$915



EVERYTHING YOU NEED FOR YOUR INDOOR OR GARDEN RAILWAY 1/32, 1/29, 1/24, & 1/20.3
TRACK RAILCLAMPS BRIDGES STRUCTURES LOCOMOTIVES FREIGHT CARS PASSENGER CARS FIGURES ACCESSORIES

SCRATCH BUILDING SUPPLIES: GRANDT LINE PRODUCTS, OZARK MINIATURES, PRECISION PRODUCTS, WOOD
FULL LINES OF ACCUCRAFT, AML, AMS, ARISTO-CRAFT, BACHMANN, USA TRAINS, LGB, HLW, PIKO, KADEE
JUST PLAIN FOLKS, WOODLAND SCENICS, SPLIT JAW RAILCLAMPS, BRIDGEWERKS, PRIESER, POLA
PHOENIX SOUND, DALLEE ELECTRONICS, NEC, RAM, QSI - CUSTOM PAINTING AND DECALS

PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE OTHER SCALES AVAILABLE SIG 9/10-2014



In service: *Saxonian No. 54 at the Mügeln station in 2010. Photo: WikipediaCommons/ Wassen.*

2005. No. 54 was to have been delivered in Germany in March and should be currently available. It retails for €2650 with radio control (about $US2960) or €2250 without R/C (about $US2515).

Schug also said that it is re-running its popular 1:19-scale Decauville 0-4-0T; the new run will include versions in both 32mm and 45mm gauge. The price for the Decauville is expected to be about $US1700.

MBV Schug, of Detzem, Germany, is on the Web at http://www.accucraft.de or by phone at 49-6507-802327 and Accucraft's site is http://www.accucraft.com and its phone is (510) 324-3399.

Welsh Coal

In Stock

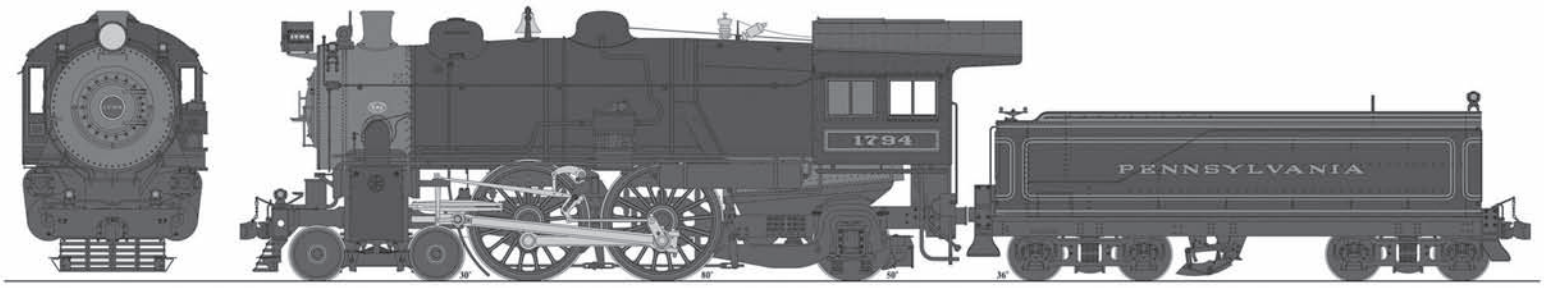
THE TRAIN DEPARTMENT

732-770-9625

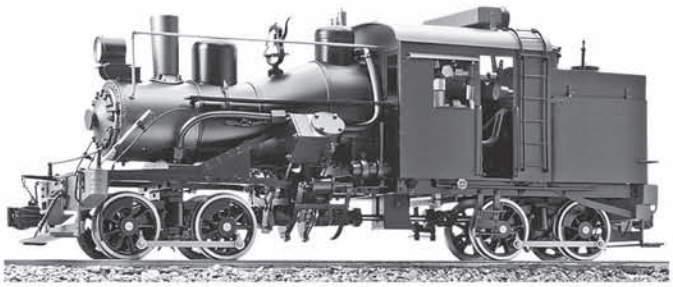
***REGNER* - ROUNDHOUSE - ACCUCRAFT**

WWW.THETRAINDEPARTMENT.COM

Llagas Creek
Sunset Valley
Peco Track



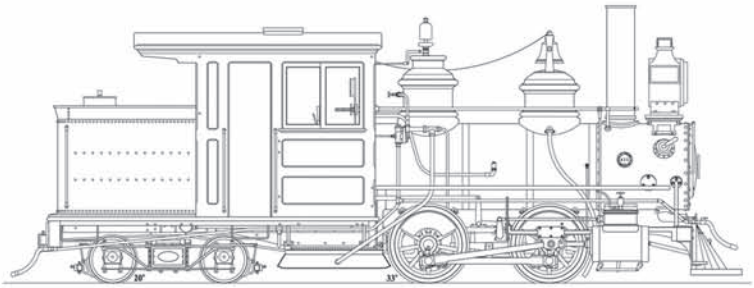
PRR E6s Heavy Atlantic - Accepting reservations for Fall 2015
Butane ceramic and Alcohol fired in both Green lined and Black livery.



Logging arrivals for 2015

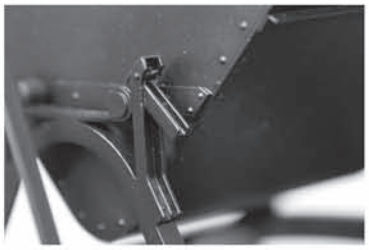
3 Cyl Shay - Wagontop boiler

WSL Heisler



Accepting reservations
7/8ths S.R.R.L. #6 Forney

7/8ths RTR Brass Tipper/Skip wagons - Available Spring 2015



Your source for your live steam and railway needs.
Looking for small parts and accessories?
We have them!

Used inventory
Accucraft SAR NG15
Accucraft Royal Hudson

Scratch building a 1:32-scale steamer with laser-cut brass

LASER LOCO

Text, photos and illustrations by Keith Bucklitch

Having constructed my fleet of Gauge One Lancashire and Yorkshire Railway fish rail cars ("vans," in the vernacular), I needed something to pull them. What better than an Aspinall A class 0-6-0 loco? It had to be live steam, of course.

Last issue I discussed designing the locomotive using two-dimensional and three-dimensional computer-assisted design software (2D and 3D CAD) to create the A class, which is based on the Gauge One Model Railway Association's ARMIG 0-4-0, with some components coming from G1MRA's "The Dee Book." ARMIG (that's G1MRA spelled backwards) relies upon hobby supply companies in the United Kingdom which make and sell specific components, freeing the hobbyist from lots of machining.

In addition to design, in the first part of this article I addressed building the frame and boiler, machining the cylinder blocks, turning the driving wheels, building the piston and valves and making an oiler and axle pump.

Preserved: *Last surviving L&YR Class 27 Aspinall 0-6-0, at Buckley Wells on the East Lancashire Railway in 2008. Photo: Flickr/David Ingham.*

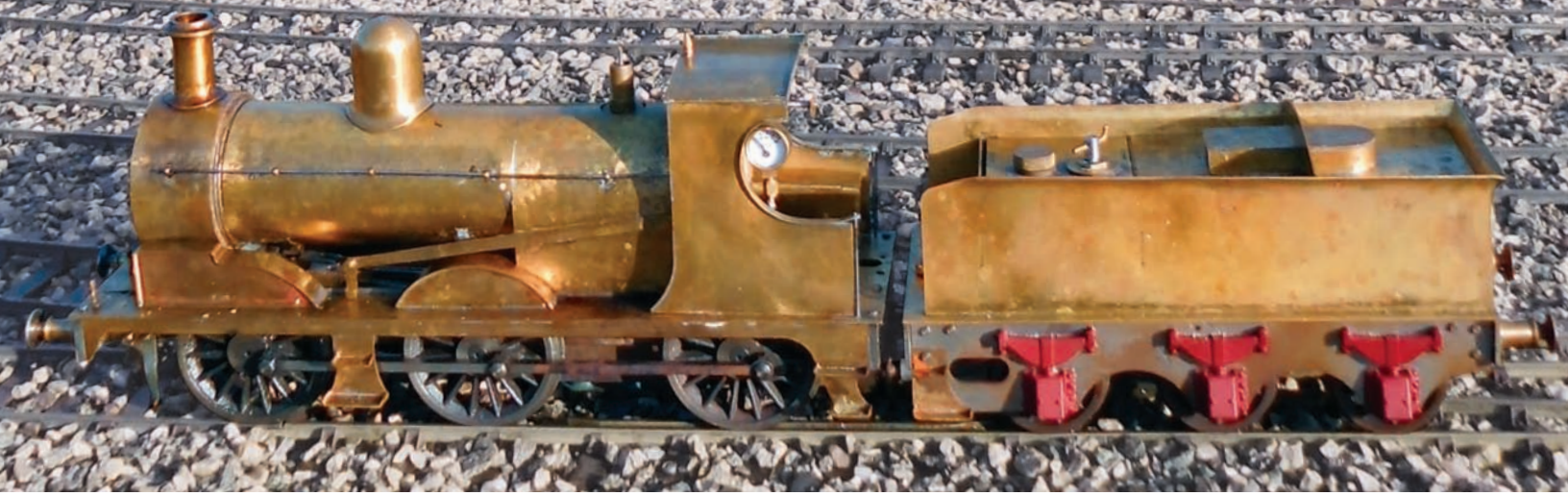
Superstructure

A model does not really begin to look like a locomotive until the basic outline is in place, so work was begun on the superstructure. Previously, I had used etching techniques to produce superstructure components for models, because my normal laser cutter firm was not enthusiastic about cutting brass, and copper is a definite no-no. (Apparently brass reflects the laser beam back on the head and can cause major — read expensive — damage to the cutter.)

However, Model Engineers Laser of Doncaster, U.K., offers a brass laser cutting service. As Malcolm High had produced some Gauge One loco kits himself, using the mortise-and-tenon technique, I decided that I would produce the superstructure components by laser cutting instead of etching. One problem with laser cutting is that it is not possible to produce a "half etched" effect. This meant that I had to rethink some components; particularly where previously I would have half etched a fold line to make up a particular component, such as a fuel tank.

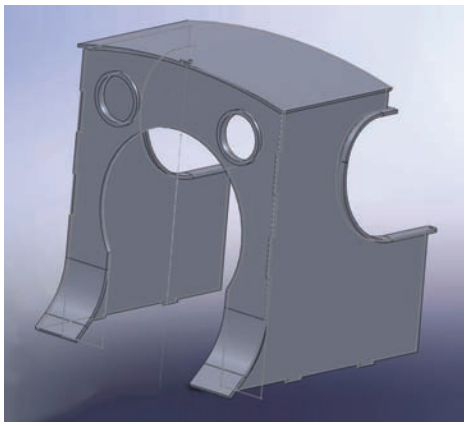
I could either produce two separate sides, using tabs to align them and solder together, or, create

A slightly different version of this article originally appeared in The Lancashire & Yorkshire Railway Society Magazine*, Nos. 260 (July 2014) and 261 (October 2014).*



Completed: *Aspinall 0-6-0 in 1:32 scale out for some morning sunshine in its unpainted splendor.*

short, narrow laser cuts along the line of the intended fold — rather like a dotted line on a sheet of paper. The metal could then be bent easily along this line. If necessary, either to seal or strengthen the fold, a fillet of solder could be applied along it. So the original outlines of the components first produced in the 2D CAD were modified to produce the mortise and tenon joints. In some cases, the component was extended to create the mortise, and after assembly, the excess metal was filed away to leave a sharp corner.



Cab drawing: *3D model of the superstructure.*

Again it was found that this method of assembly produced items which were automatically square before soldering. When soldering the items together, I initially tacked them with small blobs of solder cream, which were then fused by use of a resistance-soldering unit. A fillet of solder was then run along the joint to secure it firmly. As before, the speed of assembly was rapid and I had a complete tender body assembled in under one hour.

Some components, such as the wheel splashers (like a truck's mud guards), steps and the like — which had to be soldered to the foot plate later — were silver-soldered to avoid unwanted disassembly while soldering to the larger foot plate. By using tabs on the valance and slots in the foot plate, the valance provided stiffening, without the use of brass angle as my previous practice.

The foot plate component consists of two sides, a front plate before the smoke box and the cab plate. Initially, these were cut as a single piece. Narrow laser-cut slots (0.2mm wide) were created, which eventually were used to guide a razor saw to separate the components once their fixing points to the buffer beams and similar were located.

I was particularly impressed by the accuracy of the laser-cut components. For example, the foot plate fit perfectly over the frame assembly without any adjustment required. I must confess that when I came to fit the valance to the foot plate, I found two slots were half-a-millimeter out of place.

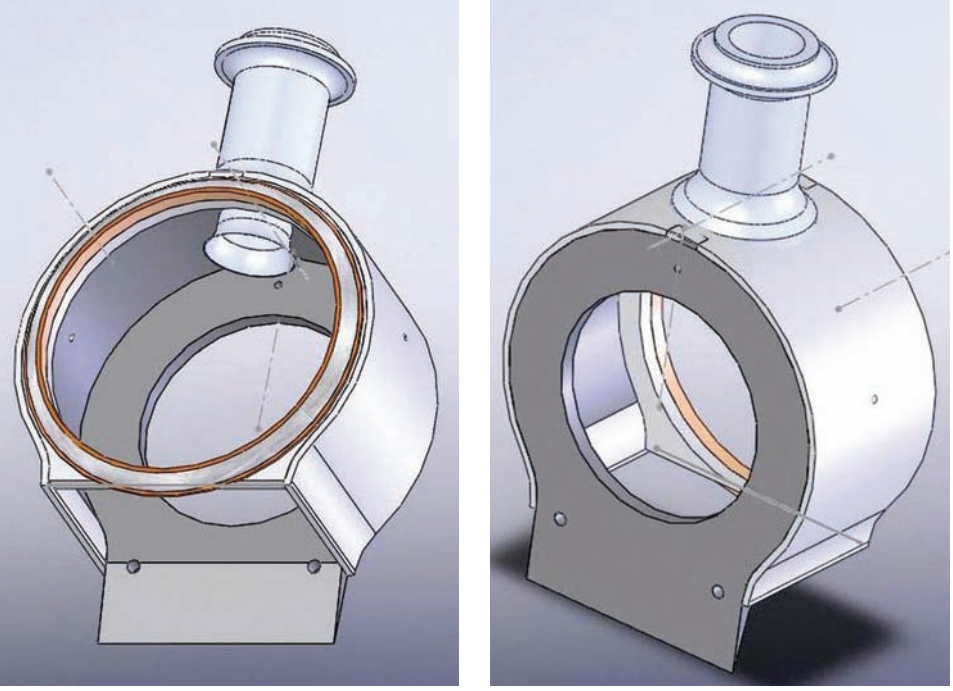
Checking the drawings showed that the error was mine and not the laser cutter's, but a bit of gentle filing allowed the parts to fit snugly together as intended. Soldered into position, the valance provided stiffness and rigidity to the foot plate. The steps were soldered in place using the slots provided for location.

The cab components — sides and spectacle plate — were assembled and silver-soldered together for strength. Later, after fitting to the foot plate and using the slots for alignment, some brass angle was soldered on to provide fixing points for retaining screws. The roof and window rings and trim were soft-soldered in place after the hot work was completed.

Lanky 0-6-0

English live steamer Keith Bucklitch gives a blow-by-blow account of how he used two- and three-dimensional computer-assisted design software and metal laser-cutting techniques to build a Lancashire & Yorkshire Railway Aspinall A Class, 0-6-0 locomotive.

- **Part 1:** Basing the design on the Gauge One Model Railway Association's ARMIG; developing the oil delivery system; building the axle pump.
- ➲ **Part 2:** Building the superstructure, the smoke box and tender, as well as working on the fuel supply, the hand pump and making the details. Then the locomotive is out for its first run.



Smoke 'em if you got 'em: *Rear and front view of smoke box.*

Smoke box

The smoke box was assembled from laser-cut components, consisting of a front and rear plate 3mm thick and a wrapper of 0.7mm brass, the whole silver-soldered together. A further boiler-mounting ring was soldered on to the rear plate. The laser-cut parts incorporated the mortise and tenon system for alignment, as in my view, nothing looks worse than a chimney that leans to one side. A brass sleeve was soldered in place as a chimney liner, with the lower end inside the smoke box flared to produce the skirt. The chimney, bored to a push fit, sits on this sleeve.

The smoke box door was turned from two disks of 3mm thick brass, soldered together and turned to diameter and profile. A locking door mechanism and hinges were made up from castings produced by Just the Ticket of Wiltshire, England.

Tender, fuel supply

The tender sub frame (sides and beams) is laser-cut from 1.5mm steel. Although I used the mortise and tenon method, I decided that because I needed to be able to remove the wheel sets, the frames had to be able to be dismantled. Therefore they were assembled with brass angle at the corners, riveted to the beams and screwed to the side frames. The tender body was also secured to the sub frame with brass angle running along the top of the side frames.

Originally, the axles ran directly in the holes in the frames. The holes were drilled one-eighth-inch diameter, with the holes for the central axle slotted to allow this axle to move up over uneven track. After the first run of the locomotive, I decided that I would drill out the front and rear axle holes and fit brass bushings for a larger bearing surface.

The tender superstructure was also laser-cut, using the mortise and tenon technique for assembly. This was a little tricky to assemble, but not especially difficult, as I had to fit a number of components — the two sides, rear, dividing panels and top frame — into each other before they could be soldered together.

The tender sides and rear needed to be curved to produce the flared top. This was done by clamping the work piece in a vice between a length of bar and some round rod of appropriate diameter. Pressure was then applied by hand (and a piece of wood) to bend the brass to the required curve. This was relatively easy to do and in this instance it was not necessary to anneal the brass before curving.

The fuel (meths) tank was also made from panels secured with mortise joints and soldered together. The fuel delivery works on the "chicken feed" system, whereby fuel drips from a valve into a sump beneath the foot plate. A breather pipe also leads into the sump. As the level of meths rises, the bottom of the breather pipe becomes covered, which cuts off the air supply to the interior of the tank. A vacuum is created in the tank, which slows the flow of fuel. As the fuel is consumed, the level falls in the sump, uncovers the breather pipe and the flow recommences.

The fuel sump is simply a length of copper tube with an outlet pipe and mounting bracket, silver-soldered together. This is mounted beneath the floor of the tender. A length of silicone tubing connects the sump to the burner tubes.

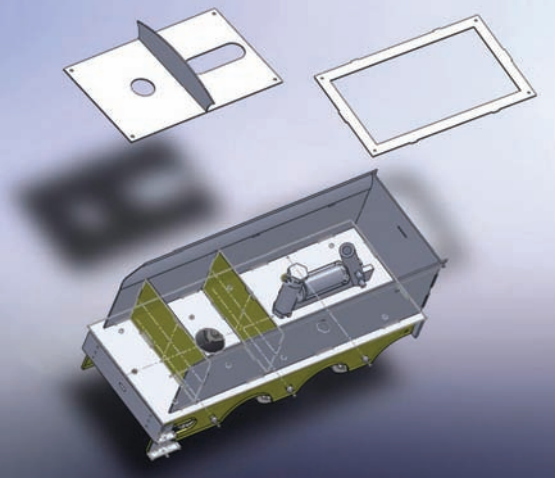
The burners consist of three thin-wall 10mm diameter brass tubes, silver-soldered to the 4.8mm diameter feed pipe. The burner tubes are 23mm long. The wick material is a ceramic substitute for the classic asbestos string which was commonly used up to a few years ago. By packing the burners with more or fewer strands of material, one can control the flow of meths, the steaming rate and to some extent the fuel consumption.

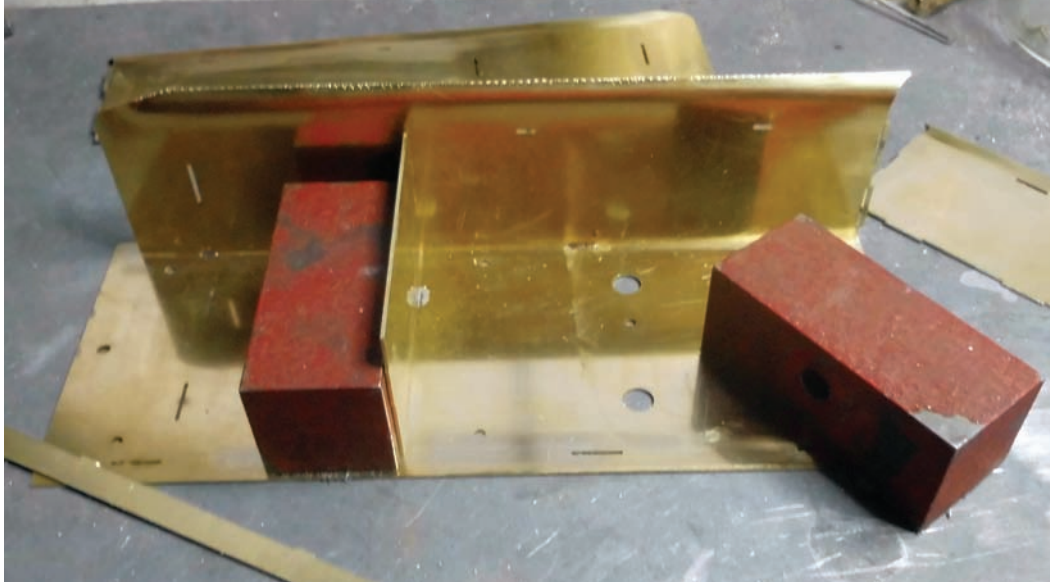
Hand pump

The hand pump fitted in the tender is borrowed from "The Dee Book," and makes for a compact pump. The arm for the pump handle is covered by the dummy water filler cap.

The top valve box just protrudes through the top of the tank. However, this will be covered by the tank filler lid following a redesign of the tender top.

(As an aside, have you noticed how additional information, that completely alters one's perception of a part of a loco always appears after one has





Tender moments: *Left, an exploded view of the design; right, the brass on the workbench.*

actually made the part? So far I have had to redesign the top of the tender, and the tender axle boxes as a result of new photographs or drawings being sent to me by various G1MRA members. I am grateful to all those who provided such valuable assistance.)

Details

I discovered that Walsall Model Industries of West Midland, England, produced sets of turned Aspinall buffers to suit Lancashire and Yorkshire Railway locos, so a set was purchased and fitted, although no doubt I could have made them myself. Walsall also markets hook-and-chain couplings. The hook on the front of the loco was cut short and soldered in place because of the limited clearance between the buffer beam and the oil tank.

I needed some dummy axle box and spring assemblies for the tender. I know of no one producing castings for these locos, so I had to produce my own. As with my fish vans, I drew an axle box and spring assembly in 3D CAD, then emailed the drawing to the firm who produced the 3D printouts.

These were printed in acrylic. I found that some of the small links between various parts of the spring/axle box assembly were almost too fine, and consequently some of them were damaged in the post. The drawing was modified to strengthen these areas and a fresh set printed off. The level of detail obtainable by 3D printing continues to improve as can be seen in the picture on Page 22.

Standard handrail knobs and wire were used along the side of the loco. The smoke-box door is hinged, and when closed is secured in place with an eccentric operated latch. Turning the front of the smoke box "dart" rotates the latch and allows access to the interior of the smoke box. In order to maintain the partial vacuum in the smoke box, a thin film of silicone sealant is applied around the rim of the door before closing.

A turning job which I rather enjoy is making chimneys (smoke stacks) and domes. I start by fly cutting the end of a length of bar of suitable diameter to fit the smoke box or boiler wrapper. The bar is mounted on the cross-slide of the lathe, suitably packed to bring the center of the bar to the center-height of the lathe.

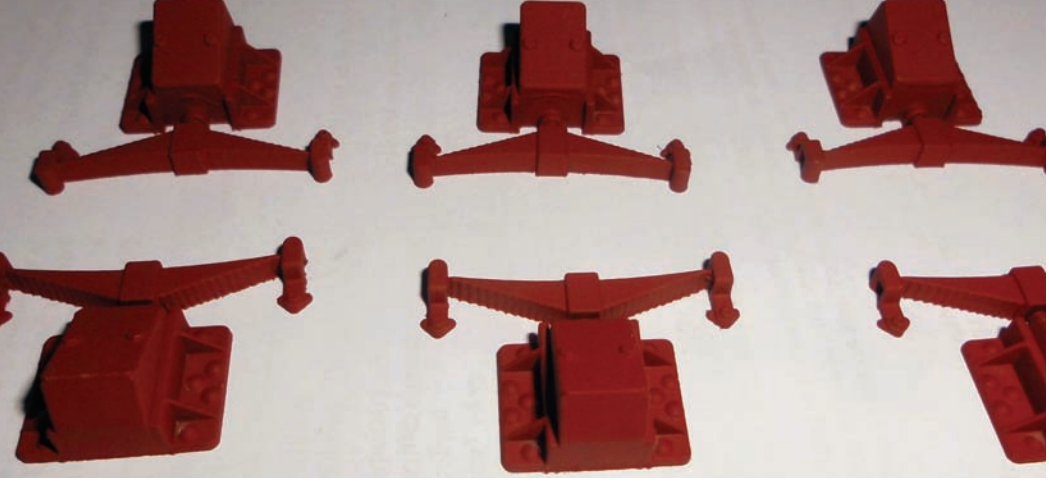
A fly-cutting tool holder is mounted on the lathe nose, set to the correct radius, then the cross-slide is fed into the work piece until just touching the cutter. Advance it a further five or 10 thousandths of an inch and wind the cross-slide towards the head stock. Withdraw, advance a further 10 "thou" and repeat.

Continue until the base of the bar is cut to the required radius. Now cut off a length of bar suitable for the required job, plus a couple of millimeters. Mount this in the lathe chuck and drill a hole 10mm diameter (in the case of the A class chimney), for the full length of the work piece. If it is a dome, then I only drill the hole for about 15mm deep.

Remove from the chuck. Now, mount a piece of scrap bar in the chuck, then turn it down carefully for about 14mm long until it just slides into the previously drilled hole in the work piece. The mandrel should now be running exactly true, even if the chuck was previously doubtful. Glue the work piece on the mandrel with a thread-locking compound such as Loctite or similar adhesive, and allow to cure.

Alternatively, cut a thread on the mandrel and tap a similar thread inside the work piece and screw the two together. Ideally, one should not remove the work piece from the chuck now until all the turning is completed, but should it be necessary, then as a precaution I always center-punch a locating spot on the mandrel against the No. One jaw of the chuck.

With the work mounted securely on the mandrel I rough turn almost to the finished dimensions. Next, carefully turn down the straight areas to the finished dimensions. I then replace the cutter with a round-ended cutter and turn the radiused parts of the piece down to the flange, but leaving the area where the flange dips down to the curve of the smoke box.



Three-dee: *Axle boxes printed in acrylic have a high level of detail.*

When the profile is turned to the correct dimensions, remove the mandrel with the work piece from the lathe chuck. One now has to finish the shaping around the flanged end. This is done by hand using a combination of rotary drill, sander and router and hand files. The work piece can be held in a vice by the mandrel while this is done, allowing one to rotate it as necessary to access all parts.

Finally, one ends with a chimney or dome that looks and is correct to size and shape. Some chimneys have a tapered appearance from the outside. This taper is three degrees and is replicated on the inside of the chimney as well. For an electric-powered model, the inside taper is not necessary, but for a live steam model, omitting it may make all the difference to the steaming ability of the locomotive.

It is easily imparted at the turning stage by setting over the top-slide to the appropriate angle for both the inside and outside turning. Once the chimney/dome is turned, the adhesive bond can be broken by gentle heating of the mandrel, until the work piece can be pulled off.

Initial running

On its first steaming, after 100 yards or so, the loco showed evidence of binding in forward motion, but would run freely in reverse. Upon return to the workshop, the cause was tracked down to the Scotch Crank fouling the rear of the fire box as it settled in. A bracket was fabricated to support the front end of the crank with satisfactory results.

A more serious problem was failure to maintain boiler pressure. The height of the blast nozzle was checked and it was felt to be too high, allowing air to be drawn down the chimney, which reduced the smoke box vacuum. The nozzle was lowered by 2mm which has transformed the steaming ability. The loco now runs, blowing off intermittently.

Another problem was the axle pump not keeping up with demand for water. This was eventually traced to a poor connection with the clack valve on the boiler back head and has now been sorted satisfactorily.

In the months since its first steaming, the "temporary" safety valve has been replaced with the typical Ramsbottom twin-turret design, but this is awaiting fine tuning for best performance.

Conclusion

I now have a useful addition to my fleet of locomotives, particularly one appropriate to pull the fish vans. The loco awaits painting, but as I can ruin a perfectly good model simply by pointing a paint brush at it, I shall have to find a willing volunteer for that job. The introduction of the ARMIG power unit lends itself to many of the L&Y small locomotives, so the next decision is whether to build a Barton Wright 0-6-0, or one of the tank engines.

However, I suspect that the next model to emerge will be either a butter van, or a brake van, probably the latter to hang behind the fish train. Trouble is, I am not a lover of the "tin tab" brake vans, but I have found drawings and photos of the W-wheel, 20T brake van, so I suspect that shall be my next project — if I don't start another loco first.

Several of the components used can be purchased from the suppliers listed last issue, and it is possible that Model Engineers Laser will supply the chassis and superstructure components in the future.

Acknowledgements

Particular thanks go to Barry Applegate for his checking of my original boiler design and coming up with some modifications. Without the work of Dick Moger in producing the design for the ARMIG power train, this model would probably still be a dream in my mind. The original drawings that kick-started me were found in Barry Lane's book "Lancashire & Yorkshire Railway Locomotives" (Pendragon, 2010). Peter Ward and Barry Staverton both sent me a considerable number of photographs of the loco, with many detail shots. Malcolm High gave considerable help with designing the parts for laser cutting, while Francis Leach of 3D CAD Systems provided patient advice and guidance. No thanks at all go to the Embsay & Bolton Abbey Steam Railway (E&BASR), who totally ignored my repeated requests to go up and measure and photograph the preserved locomotive.

— *K.B.*

Tools and equipment needed for a small-scale live steam

WORKSHOP

Text and photos by Jeff Young

"What sort of workshop equipment do I need for live steam?"

This question is often asked by those folks who are contemplating joining or have recently joined the small-scale live steam ranks. The simple answer is it depends on what you want to do.

Do you plan on just maintaining your loco? Do you hope to carry out minor modifications or upgrades? Do you want to do a major kit bash or even scratch build a live steamer?

Categorizing the activities into one of three groups (basic, intermediate, advanced) can help better identify what should be in a well-equipped workshop for live-steam locomotives. It is important to point out that these are not hard-and-fast requirements; rather they are based purely on my own personal experiences and preferences.

It should be noted that in pulling my thoughts together, my assumption is that most folks already have the necessary basic tools to run their locomotives, the usual assortment of household tools as well as some typical hobby tools: a rotary tool (like a Dremel), craft knives, small pliers and the similar. Also, other necessary equipment such as safety glasses and a shop apron should be available.

Basic

I consider basic live-steam shop state-of-good-repair work as adjusting valve-gear timing, restoring damaged threads on fittings or perhaps installing different couplers. To undertake these or similar tasks, here is a list of tools to start out with.

That old saying "measure twice, cut once" certainly applies to the live-steam workshop. To ensure accuracy in your work, quality measurement tools are essential no matter what the level of complexity of the project.

Basic tools: *Left, engineer's squares. Top, digital calipers. Bottom, digital micrometer.*

Therefore, the first tools in equipping the workshop should be precision measuring tools beyond a tape measure. Surprisingly, a good pair of digital calipers can now be found for under $50. A digital micrometer is also useful for measuring the diameter of round stock and costs about the same. A quality six-inch or 12-inch steel rule (with 1/32-inch increments), engineer's square and a scriber are essential for marking out sheet metal.

A spring-loaded center punch is invaluable in insuring that holes are positioned correctly for drilling. You can go one step further and get an optical center punch. These contain an eyepiece (with cross hairs) to line up the position of hole. The eyepiece is replaced by a hard pointed rod, which is smartly tapped with the a hammer to create the punch mark. This is one of the handiest tools around.

The first power tool I bought for my live-steam workshop was a decent variable-speed bench drill press. These can be had for around $100. A drill press will ensure that you are able to drill a perpendicular hole of the right diameter in the right place. Correspondingly, you will need a set of good quality drill bits. I have found that the titanium nitride

More tools: *Left, scriber, punches, optical center punch. Middle, drill press with machinist's vise. Right, center drills.*

coated ones tend to keep a sharp edge longer.

Obtain a full set, typically around 115 bits (containing fractional ones from 1/16-inch to one-half-inch, letter ones A through Z and number drills from 1 down to 60) which will meet your requirements. If you have a need for tiny holes, pick up a set of number bits from 61 to 80, obtainable from good hobby shops.

For holding work in a drill press, a machinist's vise is a useful piece of equipment. They come in a number of sizes, so pick one that matches both the drill press and what you are planning on holding. Also, a set of center drills are useful indeed. Regular drill bits may bend and wander when first starting a hole. A center bit will ensure that the hole is started in the correct location, then can be drilled to the finished diameter with a regular bit.

The second item I bought for the workshop was a good-heavy duty bench vise which could be bolted to the workbench. After the drill press, it probably sees the most use in the work shop. Mine swivels and has a good size anvil on the backside. A set of vise soft jaws fit inside the vise's regular jaws. These are held in place by magnets and have rubber pads that protect paint work and delicate parts while they're being held.

Live-steam locomotives often have fasteners that are uncommon. British-built ones often use BA (British Association) nuts and bolts, and pipe fittings will often be ME (Model Engineer) threads. It should be noted that Aster and Accucraft locomotives favor metric fasteners and fittings for their locomotives.

Taps and dies (for cutting internal and external threads) are worth getting, especially if you have to make a replacement part or clean up damaged threads. Tap and die sets can be expensive, but good quality ones will last you many years. You can also just buy individual taps and dies. These can be obtained from specialist tool suppliers or on-line model engineering supply houses.

As well as the taps and dies, a die handle and tap holder (particularly one that can be held in a drill press) are essential items to ensure that threads are properly formed.

A set of good-quality Swiss needle files are extremely useful, as well as a jeweler's saw. A jeweler's saw is handy for metal work, smaller and more precise than a household hacksaw.

A source of compressed air is handy to have, useful for air-testing of locomotive chassis for adjusting timing and for blowing dirt and debris out of the way. Some folks use a garden sprayer or a tank that can be recharged. Another option of course is an air compressor. Mine sees double duty in the workshop as I also use it to power my airbrush for painting.

A machinist's or model engineer's reference book is handy to have when you need to figure out tap drill sizes. My dog-eared and oil-stained copy of Tubal Cain's "Model Engineer's Handbook," is never far from the workbench when I am building something.

Intermediate

I would consider intermediate-level live steam workshop activities to be minor modifications and fabrication. This includes such things as altering the taper on a steam or gas valve stem, and simple fabrication, such as making a new lubricator cap, or perhaps a new locomotive cab from sheet brass, using soft-soldering techniques.

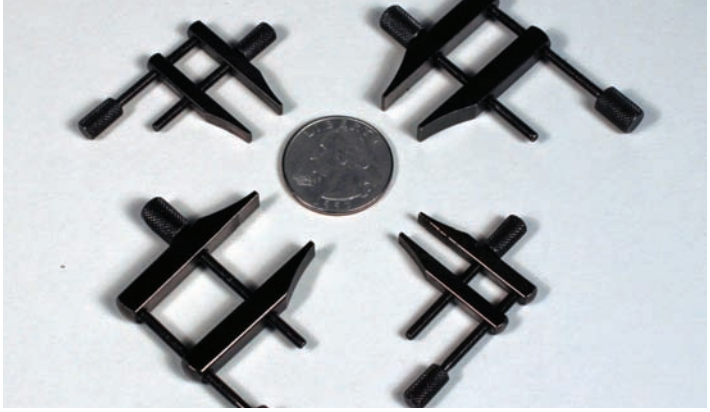
For soft soldering, I use both a heavy-duty 100-watt soldering iron (my father's, it is at least 60 years old) and a butane micro-torch. I like the one that comes with a base so it can be set on the workbench.

Machinist's clamps are handy for holding pieces together while you drill or solder them. They come in all sorts of sizes, but Lee Valley Tools makes some tiny ones that are perfect for a lot of live-steam work.

For cutting sheet brass or tinplate, both hand or power nibblers allow the material to be cut quickly and accurately.

I think some of the activities in this category might need a table-top micro lathe such as those produced by Taig, Sherline or Micro-Mark. These are ideal for precision work and great for making small brass fittings.

I would suggest to start, get the lathe, a three-jaw chuck, four-jaw chuck and perhaps a quick-change tool post. The latter allows you to change cutting



Tiny: *Small machinist's clamps (and a quarter).*

tools without needing to center the lathe tool each time. It is a real time saver.

Web sites for the above noted manufacturers are chock-full of other accessories for micro lathes. Also, there are a number of books on the micro lathe that will show you how to use them. Personally, I have found my Taig lathe covers about 80 percent of my small-scale live steam machining needs.

And what about learning how to use your lathe? At one time, you could take an evening metal-working course covering the basics of lathe practice from local high schools or community colleges. Sadly, these seem to have disappeared, at least from my area.

However there are some really good lathe-work instructional videos on YouTube.com, as well as MIT's "Tech TV." As mentioned previously, numerous books on lathe practices are available from beginner to advanced techniques (such as milling in the lathe).

Advanced

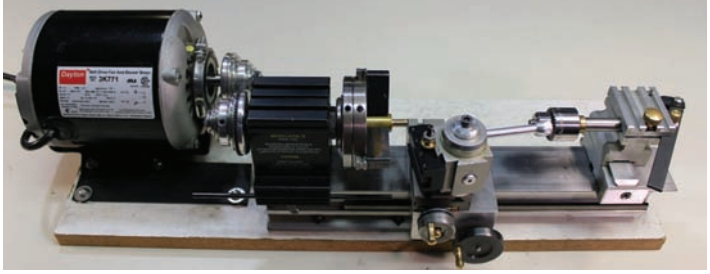
Heavy modifications — such as in making a replacement boiler, building a locomotive kit from rough castings or scratch building — would be considered as advanced live-steam workshop activities.

Silver soldering is used when you are making boilers, gas tanks and assembling structural elements of a locomotive that will need to take a load. Silver solder melts at higher temperatures than soft solder and requires more heat than typical butane or propane torches can provide. Heat is also required over a larger area all at once, particularly if you are soldering up a boiler.

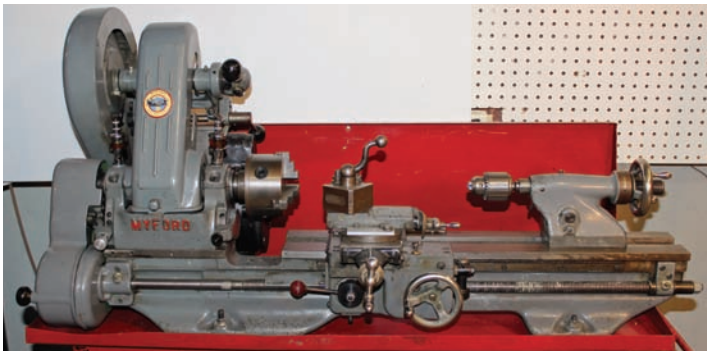
MAPP torches from BernzOmatic, available at home improvement stores, will probably cover the majority of requirements for silver soldering. If you are making large boilers, consider a Sievert torch, the favorite of builders of ride-on locomotives. These are available from jewelry, model-engine and industrial-supply houses and have a variety of nozzles for every need.

If you are machining large driving wheels (particularly those from cast iron), you will find that you need something bigger and more powerful than a table-top micro lathe.

There are lots of full-size lathe options available,



Micro: *Taig lathe with three-jaw chuck and quick-change tool post.*



Full-size: *Myford lathe, built in 1962.*

depending how big you want to go. Tool supply houses like Grizzly Industrial Inc. have a good selection. Do not overlook used equipment. A couple of years ago, I obtained a Myford 7 (United Kingdom-built model engineer's lathe) as my full-size lathe. This used lathe was build in 1962 and it runs as well as the day it was made. If you are considering buying a used lathe, I would suggest finding someone who is knowledgeable about machine tools to inspect it before you part with your money.

Although milling operations can be carried out in the lathe, many hobbyists opt for a milling machine. Like lathes, they come in all sizes from small tabletop versions upwards. Taig and Sherline make table top ones, and they readily lend themselves to the addition of computer control via a laptop. Computer numeric-control machining (CNC), once only available to large commercial machine shops, is now affordable for the live steam builder and is a real time saver if you are making a large number of the same part.

Conclusion

This is by no means an exhaustive list of tools, but it gives you a good idea of what you might need for each level of activity. It should be noted that equipping a live steam workshop is not an inexpensive proposition. Fortunately it does not have to be a go-and-buy-everything-at-once activity.

I equipped my workshop over a period of about a decade. Aside from the measuring equipment (which is needed for about most every activity), I acquired my tools as I needed them for particular projects over time. Not only was this easier on the wallet, it allowed me to develop skills on how to use them before moving on to something more complex.

ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

D&RGW C-25 2-8-0
ACCEPTING RESERVATIONS

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Coal Fired
- D-Valve
- Boiler Feed
- Tender Water Pump
- Limited Production

$5,250.00

EMMA
IN STOCK

- 1:13.7 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$1,095.00

DORA
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$481.95

RUBY #1
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$539.00

RUBY #5
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$620.00

MOGUL
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired
- R/C Ready

$2,049.00

MOGUL RGS #11
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired
- R/C Ready

$2,049.00

MOGUL 'PONCHA'
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired
- R/C Ready

$2,299.00

CLIMAX
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$2,149.00

SHAY 28T
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$2,499.00

PLANTATION
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$999.00

AMERICAN
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

starting at **$2,199.00**

NA CLASS 2-6-2T
SOLD OUT

- 1:19 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$2,750.00

HEISLER WSL #3
ACCEPTING RESERVATIONS

- 1:20.3 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane Fired

$3,150.00

A4 MALLARD
ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel
- Alcohol Fired

$3,750.00

REBUILT MERCHANT NAVY 4-6-2
ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel

$3,750.00

D&RGW K-37 2-8-2
IN STOCK

- 1:20.3 Scale, 45mm Gauge
- Butane Fired
- Brass, Steel, Stainless Steel
- Limited Production

$5,995.00

STREAMLINED PASSENGER CAR
ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Metal Body, Die-Cast Trucks w/ Ball Bearings Metal Wheels
- Available in Unlettered, SP Lark, SP Gray, NYC, SP Daylight, UP Yellow, N&W, Pennsylvania, CP
- Limited Production

$300.00/car

$1,710.00/6 car set

PLEASE RESERVE WITH YOUR AUTHORIZED ACCUCRAFT DEALER

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

ACCUCRAFT COMPANY, 33268 CENTRAL AVE, UNION CITY, CA 94587, USA TEL: (510) 324-3399, FAX: (510) 324-3366, WWW.ACCUCRAFT.COM

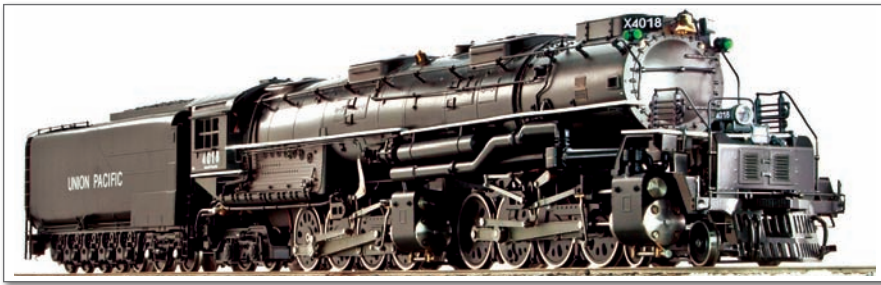
ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

C&O / VGN H8 ALLEGHENY 2-6-6-6

ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel
- Limited Production
- Butane Fired
- D-Valve

$7,000.00



UP 4-8-8-4 BIG BOY

IN STOCK

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel
- Production Limited to 75 Units
- Butane Fired
- D-Valve

$8,995.00

N&W 4-8-4 J-CLASS #611

ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel
- Production Limited to 75 Units
- Alcohol Fired
- D-Valve

$5,750.00

CP 2-10-4 SELKIRK #5935

ACCEPTING RESERVATIONS

- 1:32 Scale
- 45mm Gauge
- Brass & Stainless Steel
- Alcohol Fired
- D-Valve

$5,995.00

QJ-CLASS 2-10-2

ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel
- Butane/Alcohol Fired
- Limited Production

starting at **$4,500.00**

PENNSYLVANIA T1

IN STOCK

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel

$6,050.00

FLYING SCOTSMAN

ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel

$3,400.00

TORNADO 4-6-2

ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel

$4,250.00

SP M-6 2-6-0

IN STOCK

- 1:32 Scale, 45mm Gauge
- Brass & Stainless Steel

$2,750.00

BLACK 5

ACCEPTING RESERVATIONS

- 1:32 Scale, 45mm Gauge
- Brass & Steel Construction

$3,100.00

DB CLASS 45 010 2-10-2

IN STOCK

- 1:32 Scale
- 45mm Gauge
- Brass & Stainless Steel
- Butane Fired
- D-Valve

$5,162.00

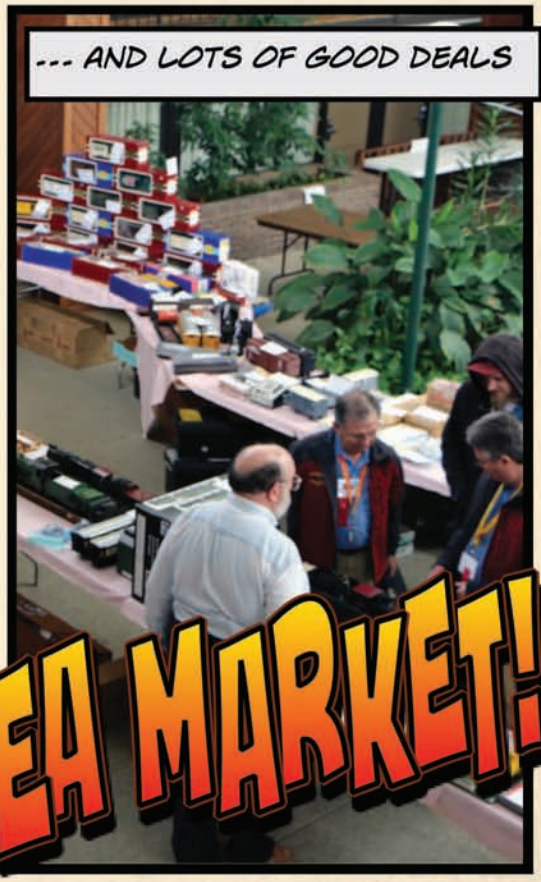
PLEASE RESERVE WITH YOUR AUTHORIZED ACCUCRAFT DEALER

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

ACCUCRAFT COMPANY, 33268 CENTRAL AVE, UNION CITY, CA 94587, USA TEL: (510) 324-3399, FAX: (510) 324-3366, WWW.ACCUCRAFT.COM

STEAMING AMONGST THE MAGNOLIAS
DIAMONDHEAD, MISS. - 2015

BY SCOTT E. MCDONALD



FLEA MARKET!!

THERE WERE LOTS OF INTERESTING PROJECTS – LIKE THIS MOD TO THE ACCUCRAFT "DORA" BY JEFF YOUNG

JOHN RILEY OF FLORIDA AND JEFF HAD THE SAME IDEA!!

JAMES RITSON SHOWS ONE OF THE MANY SCALES THAT WERE REPRESENTED

LARRY NEWMAN BROUGHT SOME HOME-MADE STUFF TOO!

JEFF PAXTON LIKES THE BIG SMALL-SCALE STUFF!

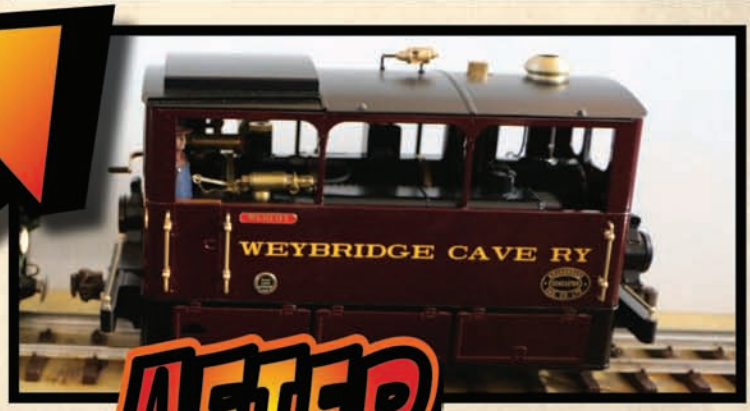
JASON KOVAC, MONTE PENCE AND BOB MOSER CHECK OUT THE SHINY PENNSYLVANIA EG COMING FROM THE TRAIN DEPT. AND ACCUCRAFT

BRUCE GATHMAN DISCUSSES A GOOD DEAL WITH DAVE FREDIANI AT THE FLEA MARKET

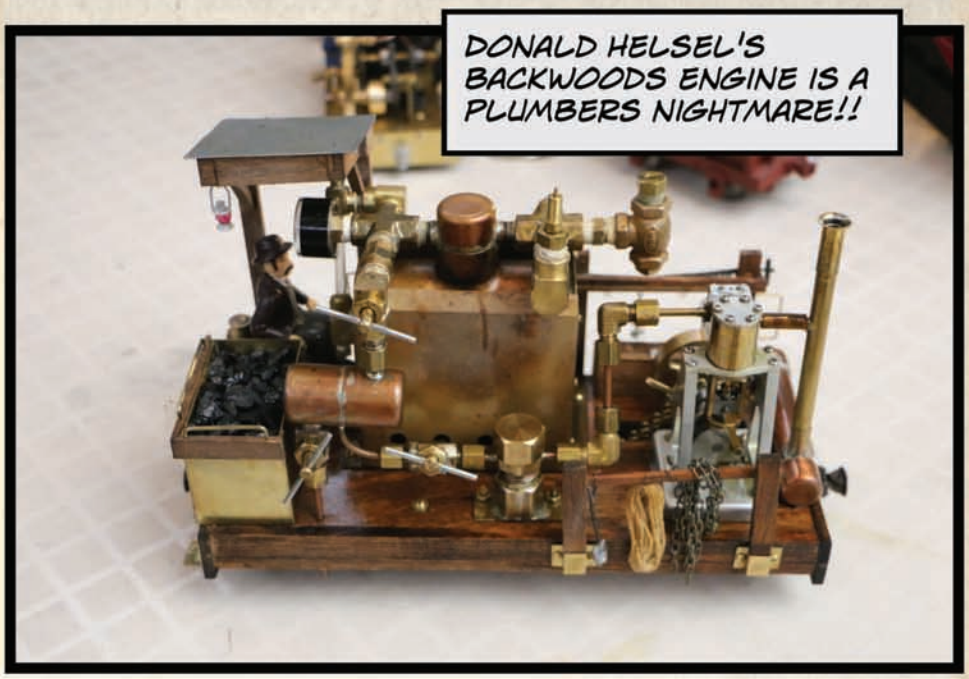
STREAKY STREAMLINE! ACCUCRAFT ALSO HAD ITS NEW NORFOLK & WESTERN "J" CLASS LOCOMOTIVE FOR REVIEW

STATIONARY ENGINES DISPLAYED!

LARRY GREEN OF VERMONT SHOWED HIS MODIFIED ROUNDHOUSE STANLEY – NOW A BALDWIN

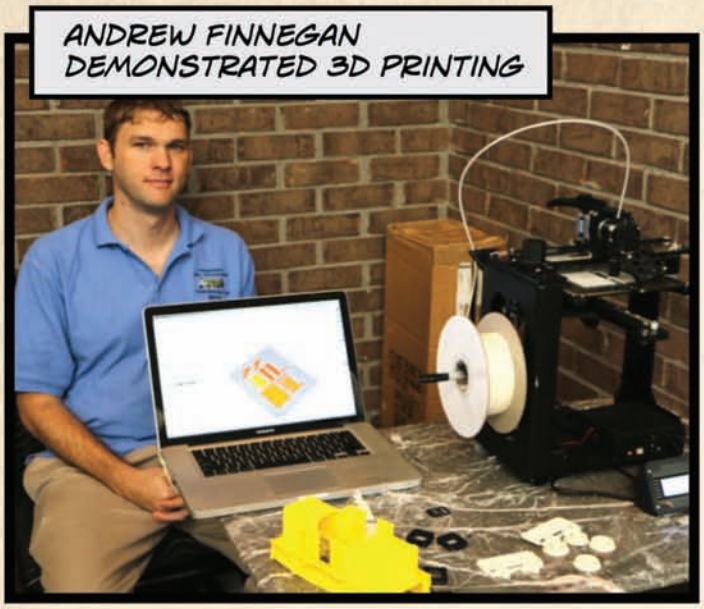



GIVE IN TO THE STEAM SIDE
X4145
X4145


DONALD HELSEL'S BACKWOODS ENGINE IS A PLUMBERS NIGHTMARE!!


WUHU BOWANDE AND ACCUCRAFT EACH SHOWED THEIR OWN VERSION OF A QJ CLASS 2-10-2 LOCOMOTIVE
BOINNNNG


ACCUCRAFT TRAINS
ROUNDHOUSE
LOTS OF DISCUSSIONS ABOUT THE NEW LOCOS FOR 2015



SEE YOU NEXT YEAR!

MORE DIAMONDHEAD 2015 COVERAGE AT HTTP://WWW.STEAMUP.COM/DH15

New material for alcohol-burning locos makes for better

WICKS

Text and photos by Will Lindley

Just the mention of the word "wicks" evokes a wide variety of emotions among live steamers. *Everyone* has an opinion as to which is the better material to use so that sufficient steam will be generated for their models.

Some think there is some sort of magic regarding the building and installation of wicks, while others go about the same process matter-of-factly. The former probably guesses a lot, while the latter has a favorite formula to use as they approach the process in a straight-forward mechanical manner. I'm of the clan that simply wants a robust flame, and that has been my focus for a while.

First, one must choose the preferred material from which to construct wicks for a particular locomotive. Materials range from sophisticated ceramics for space-shuttle tiles to stainless-steel fabric, fire brick, fireproof cording wrapped in small cords or bundles and packed individually into wick tubes, and finally, a relatively old — but not much talked about — commercial carbon fiber material called Pyron.

So much has already been written about the advantages and disadvantages of other materials mentioned, my discussion here will be limited to the use of Pyron as a wick material for alcohol-fired live steam locomotives. I believe Pyron may be the best wick material of all.

My experience with Pyron began with using a small piece of Pyron as a lighter for my Accucraft T1. On the T1, the wicks can be lit only through the firebox door in the cab. When the tender is connected to the locomotive, most butane lighters will not reach the wicks as a curve must be negotiated.

Further, I found that the lighter provided by Accucraft was difficult to use, because the small pieces of wick cording attached to the lighter wire had a habit of falling from the spring wick holder at the end of the wire.

Photo 1: *Burner with factory installed wicks.*

Photo 2: *Factory installed wicks.*

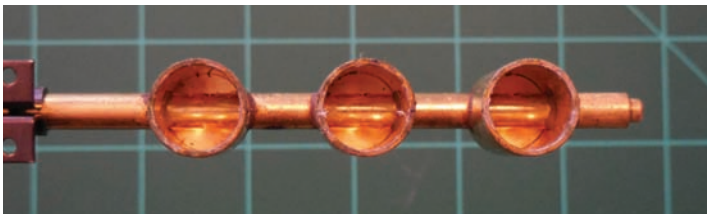


Photo 3: *Empty burner showing alcohol feed tube at bottom of individual wick holders.*

I tried using a one-half-inch by one-inch strip formed of Pyron as a lighter. I threaded the small strip of Pyron on to a wire, much like baiting a hook, and then crimped the wire to hold the wick (see **Photo 12**). When the Pyron is dipped in alcohol and

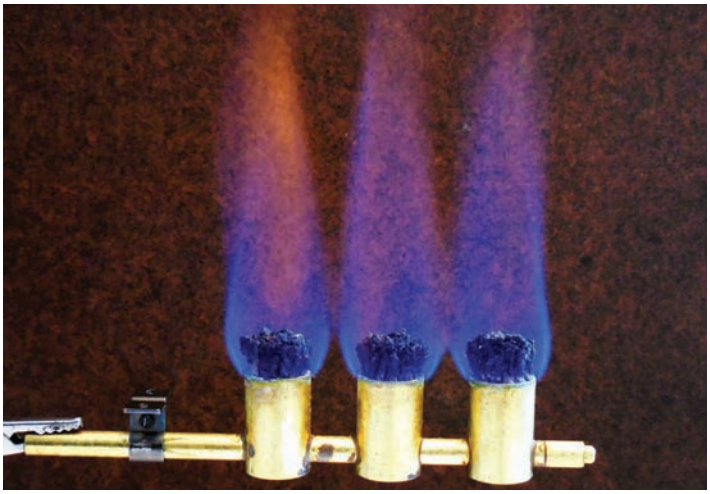


Photo 4: *Lit burner with factory installed wicks. Wicks were saturated before being lit. Note yellowness in the flame.*

Photo 5: *Three-inch by x 1½-inch piece of Pyron.*

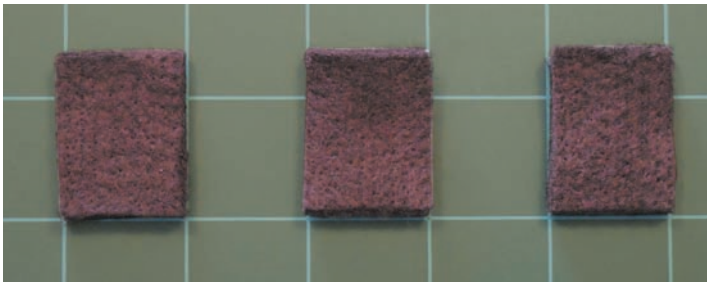


Photo 6: *Pyron cut for individual wicks.*

Photo 7: *Pyron cut to enable material to installed to reach the bottom of burner tubes.*

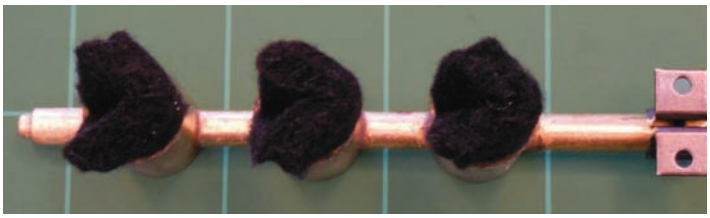


Photo 8: *Pyron installed in individual burner tubes.*

lit, the flame is strong. Lighting the wicks in the T1 has become an easy task. Importantly, the lighter is easy to extinguish, like candles on a birthday cake.

Because lighting the wicks with my new lighter was so easy, I thought about using the same material for wicks in my alcohol-fired locomotives. To date, I've now re-wicked five locomotives (all from Aster Hobby Co. Inc.): a "Schools," a "Jumbo," a "Spitfire," and as illustrated here, a USRA Light Mikado.

Also, while at Diamondhead in January, I was asked to build wicks for one of Tom Myers' locomotives, an Aster "Flying Scotsman" on which Pete Comely was working. Tom has also re-wicked his new Aster "King Arthur" in the manner discussed here. To work on Tom's locomotive was just good fortune for me as it ratified my prior work before a small knowledgeable audience.

Here's a little bit of information regarding Pyron. It is generally used as a flame protector in the construction industry. In particular, plumbers use it as a heat shield when soldering copper pipe on installed bathtub and shower fixtures where the pipes are in the walls between studs.

What makes this material attractive for use as wicks is its relatively low cost and the fact that its fibers do not disintegrate when either lighted, extinguished, handled or dampened. Also, the material can tolerate temperatures as high as 2500-degrees Fahrenheit without adverse effect.

The material is available in several forms — loose fibers such as yarn, as a staple fiber used in packing and gasket material, and as felt-like sheets in a couple thicknesses. I prefer the 6.4mm (one-quarter inch) thickness felt-like sheets for wick applications.

Look for the sheets at any big-box hardware store in the plumbing section. Each store I visited had the product sold by Oatey as a flame protector. It was available in nine-inch by 12-inch sheets for $14 to $18. Depending on the size of the wick tubes and your model, one sheet should be sufficient to make 30 to 40 or more wicks so the ultimate cost is quite reasonable. Small leftover pieces can be used as lighters so that nothing is wasted.

My USRA Light Mikado has three wick tubes, which each have an internal diameter of one-half inch and a length of 1½-inches. I've included a couple photos from the new burner for my "Spitfire" to show differences between the models.

Since the Pyron is one-quarter-inch in thickness, two layers are needed to fill the wick tube, since the tubes are one-half-inch in diameter. I decided to try a one-inch wide strip of wick material to fill the wick tube while at the same time hoping it would not be too tight or too loose.

The last thing I wanted was for the wicks to be so tight as to restrict the flow of alcohol to the top of

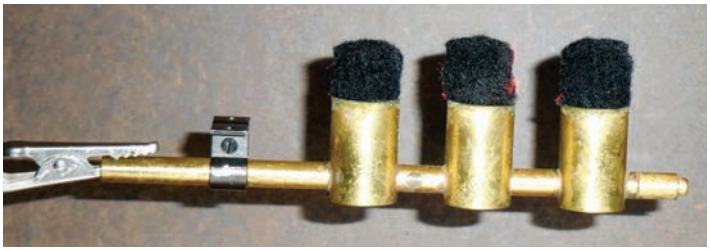


Photo 9: *Pyron trimmed so that none of the wick material protrudes beyond burner tube sides.*

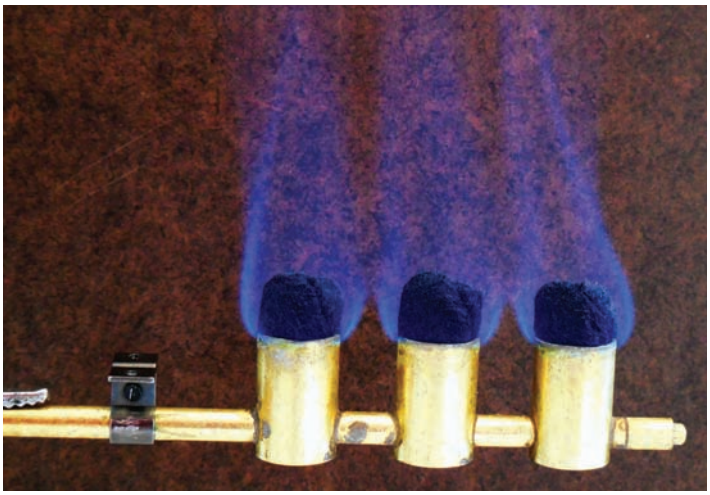


Photo 10: *Pyron trimmed to a more rounded shape and lit. A strong even flame is evident.*

the wick or too loose so that the wick would fall out during routine servicing. When folded, the one-inch strip of felt creates an almost square strip which is one-half-inch wide, the exact width of the tube.

However, because the tube is round and the edges of the felt are almost square, the felt must be squeezed a little to fit inside the tubes. With wicks of these dimensions, I could not shake the wicks loose, yet alcohol flowed freely enough to make a strong flame.

When I first lit the Pyron wicks, there was some yellowness in the flame, an indication of incomplete combustion. In particular with the "Spitfire," the flame was not as strong over the middle wick as it was over the two end wicks (**Photo 13**).

Note that in **Photo 8**, the Pyron has the shape of the folded one-half-inch by one-half-inch felt, yet it flares a little at the top and each wick also expands so that adjacent wicks restrict air flow between the wicks. On the "Spitfire," adjacent wicks actually touch each other before trimming, as the wick tubes are so much closer together when compared to the Mikado.

My first tweak was to make sure the felt reached the bottom of each tube. In the Mikado, the tube feeding alcohol from the tender is about one-eighth-inch above the base of the wick tube. Unless the felt reached the base of the tubes, the flow of alcohol to the top of the wicks could vary.

To ensure the felt reaches the bottom of the tubes,

Photo 11: *Tools used to build wicks.*

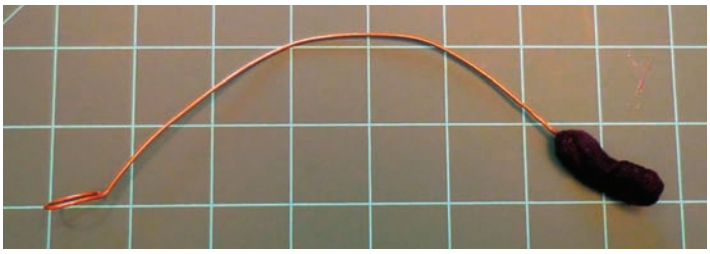


Photo 12: *Lighter as used for author's Accucraft T1.*

I cut a small notch in the center of the bottom of each felt strip which had been cut for the wicks (see **Photo 7**). The notch makes it possible, with the aid of a dental probe, to push the felt down beside the alcohol feed tube to the bottom of the wick holder.

Next, I carefully trimmed all felt that protruded beyond the sides of the wick tubes (**Photo 9**). **Photo 10** shows the results, a strong flame with no yellowness.

Photos 10 and 14 show how I trimmed the tops of the wicks to be rounded at the tops without making them shorter. The result here is a burner with a small space between each wick and each wick extends about one-half-inch above the top of the tubes.

Because the burners differ between locomotive, I've included a couple photos to compare a "Spitfire" and a Light Mikado (**Photos 4 and 13**; **Photos 10 and 14**). Note how the flame over the middle wick in **Photo 13** is shorter than over the end wicks. The wicks in **Photos 4 and 13** have not received their final trimming. The wicks in **Photos 10 and 14** show the strength of the final flames with proper trimming.

With the felt fully inserted into each tube, and trimmed to eliminate any protrusions beyond the sides of the wick tubes and then rounded on the top it was time for a new test. **Photos 10 and 14** show what I believe to be an almost perfect flame for the respective burners.

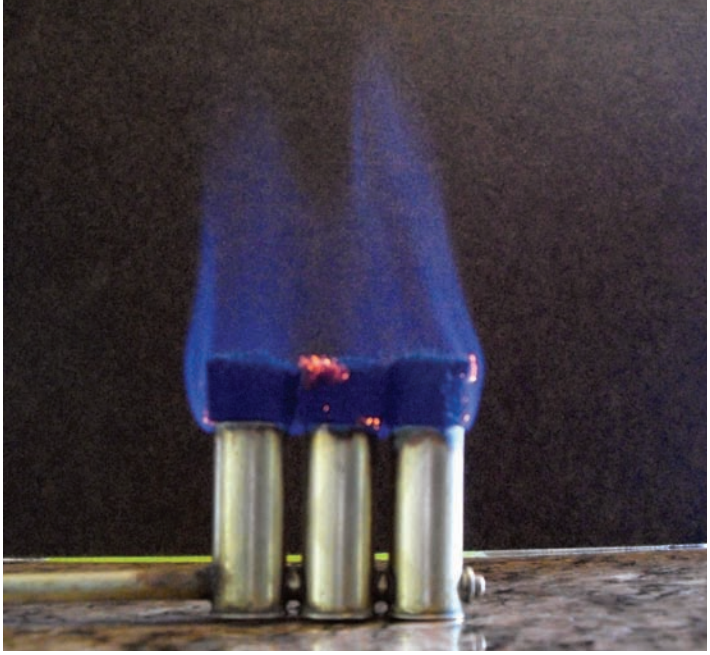


Photo 13: *Untrimmed wicks for 'Spitfire.' Note short flame over the center wick.*

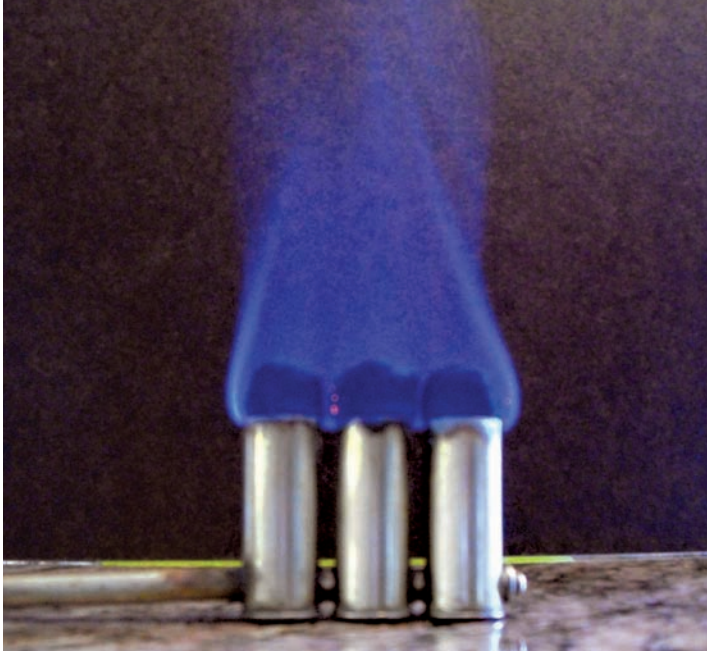


Photo 14: *'Spitfire' wicks with final trimming showing strong even flame.*

An important side benefit of using Pyron is that when the flame is extinguished with a small, hand-held carbon dioxide extinguisher, the Pyron wicks do not deform or take on a mushroom shape as do traditional wicks, so the flame produced is robust for every run.

At Diamondhead, it took only about 20 minutes to re-wick Tom's "Flying Scotsman." The wick could be and was tested (lit) as work progressed. Because the burners for the "Flying Scotsman" and "Spitfire" are similar, the result achieved was as shown in **Photo 14**. After Pete completed his work, the "Flying Scotsman" was reassembled, complete with its new wicks, and was sent for a test run. Although some mechanical issues remained, steam production was strong, with sufficient steam to blow the safety valves while on the move.

This new wick material is:

- Inexpensive.
- Sturdy, by not falling apart or mushrooming when extinguished.
- Easily built and customized for specific applications.
- Tolerant to water — unlike ceramic or cord based wicks — as it can be dried easily.
- Durable, and easily withstands the blast from a carbon dioxide extinguisher.

Even with my limited trial, I'm convinced that the Pyron felt will be a step forward in the small-scale live steam hobby.

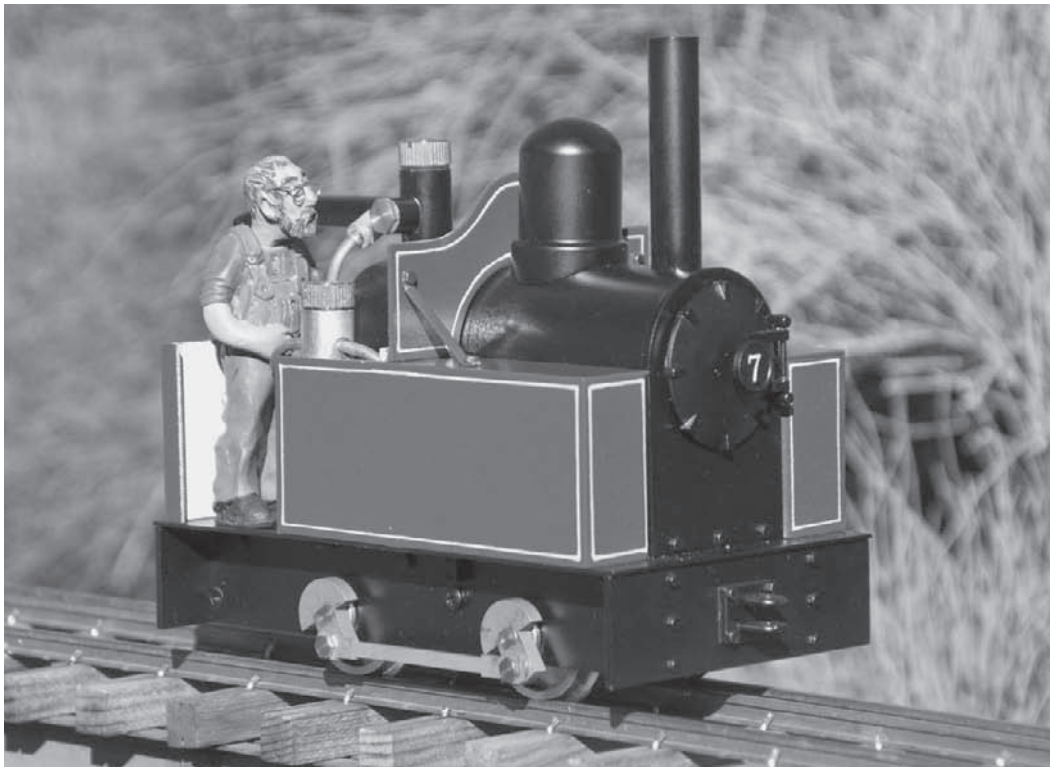
Giving Accucraft's 'Dora' a British makeover with an

OPEN CAB

Text, photos and illustrations by Marc Horovitz

One way of completely changing the character of a locomotive is by changing its cab, and "Dora" is no exception to this rule. Open-cab locomotives are common in Britain and other parts of the world, but not so much in the United States.

I wondered what Accucraft Co.'s "Dora" would look like with an open cab, so I found out. With an open cab, the controls are certainly more accessible. If you like the look, this article will tell you how to do it.



En plein air: *'Dora's' makeover gives this driver plenty of fresh air.*

Getting started

The first thing to do is to remove the roof (**Photo 1**). This is easily done by gently squeezing the hinge wire to disengage it from the retaining holes in the front and rear cab walls. Next, remove the body from the boiler/chassis by removing four hex screws, all of which can be accessed from below the foot plate. Two are at the front of the locomotive, under the side tanks; the other two are beneath the rear bunker, between the frames. Once these screws have been removed, tip the body back (**Photo 2**) to clear the throttle lever, and it should slide off easily. Set the boiler/chassis aside (**Photo 3**). Once the body is off, also remove the rear bunker (**Photo 4**) by unscrewing the two screws on the inside back wall of the cab.

The top of the cab will have to be cut off. The cab is made of steel and there are different ways of getting through it. One is with a Dremel and a cut-off disk. A faster, if more brutal method is by using a hacksaw. The latter is the method I chose.

Before doing any cutting, mark the line that is your objective – the final trim line. Use a straight edge and align it with the top of the side tank. Then, using a scriber, scratch a line in the paint (**Photo 5**). (Don't worry about the paint – it's going to get all messed up anyway.) Do the same on the back of the cab, aligning the straight edge with the bottom edge

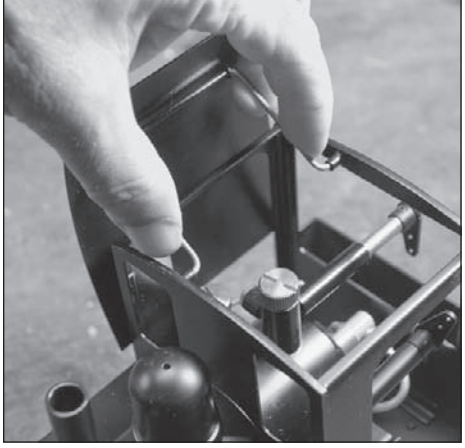


Photo 1

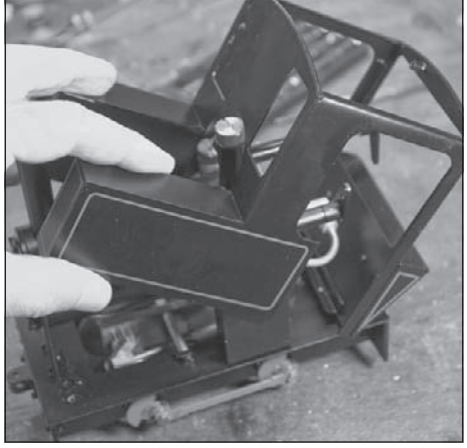


Photo 2

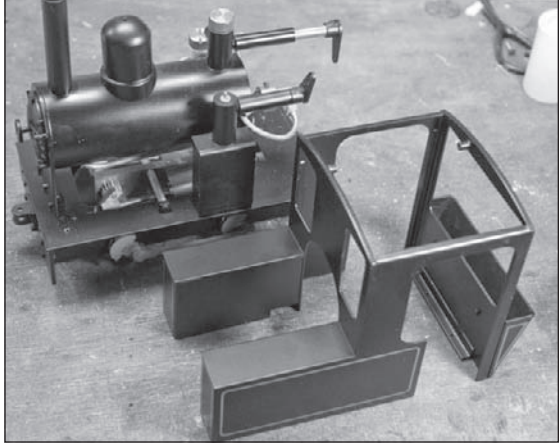


Photo 3

Photo 4

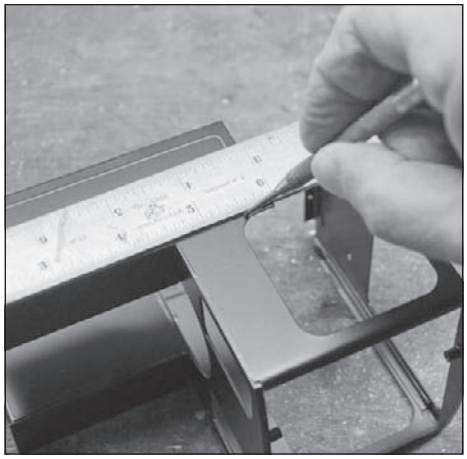


Photo 5

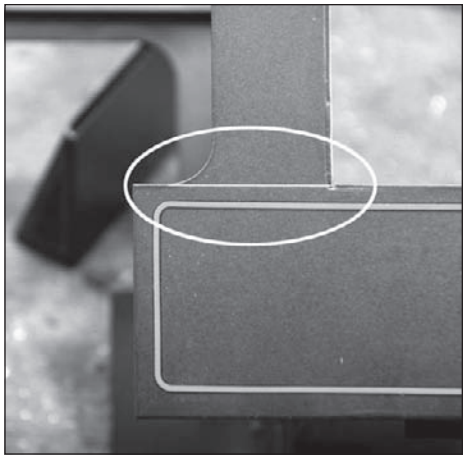


Photo 6

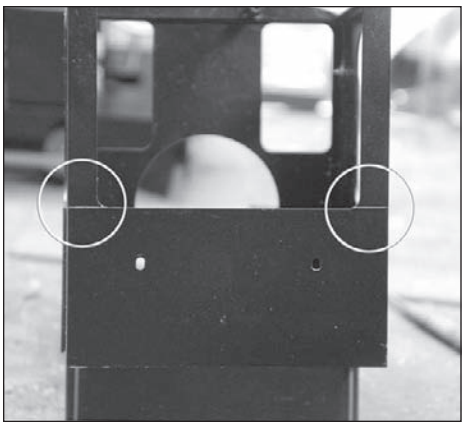


Photo 7

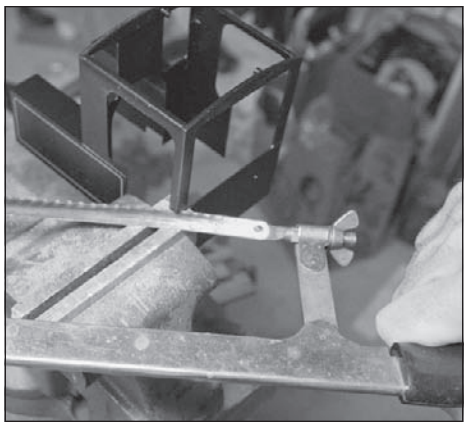


Photo 8

Photo 9

of the opening. The scribed lines should look like **Photos 6 and 7**.

I found it best to start by sawing off the back wall. I held the body assembly in a vise, with the scribed line slightly below the top of the jaws. Then, by laying the hacksaw blade flat on the vise jaws, I was able to saw through the upright legs of the rear wall, one at a time (**Photo 8**), making sure that the cut was slightly above the scribed line. You can see the scribed line just below the cut in **Photo 9**, and the rear wall separated from the rest of the body in **Photo 10**. I used a similar method to separate the front wall from the side tanks (**Photo 11**). The separated tanks and rear wall can be seen in **Photo 12**.

Naturally, the hacksaw left some pretty ragged edges. These can be smoothed with a disc sander, a belt sander, or a flat file (**Photo 13**). Both side tanks can be seen in **Photo 14**. The one in the foreground has had its cut edges smoothed, while the rear one is still raw. Once all of the edges have been smoothed, the side tanks and rear wall can be set aside for the time being.

The new front sheet

A new front sheet will replace the old one. This should be made of brass that has a little body to it. Use something along the lines of 0.040-inch to 0.060-inch-thick material.

The best way to make the new sheet is to photo-

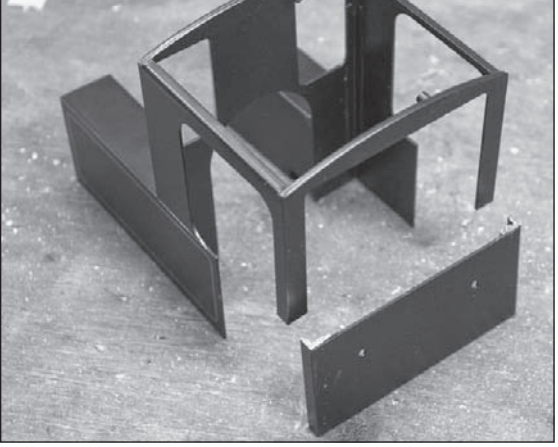


Photo 10

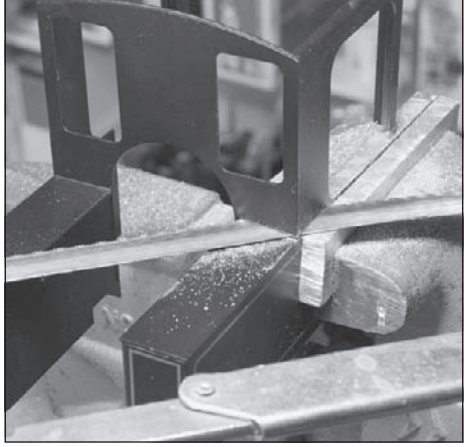


Photo 11

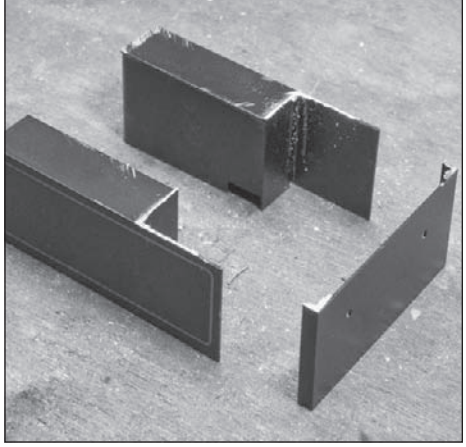


Photo 12

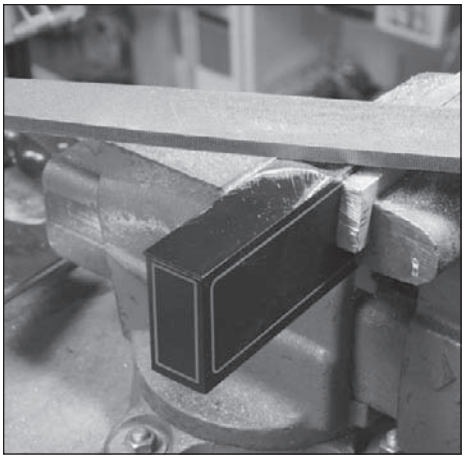


Photo 13

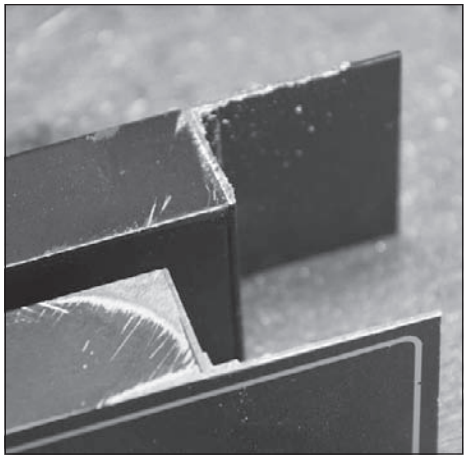


Photo 14

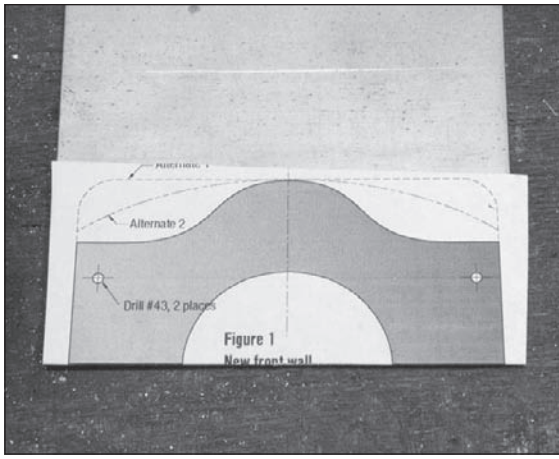


Photo 15

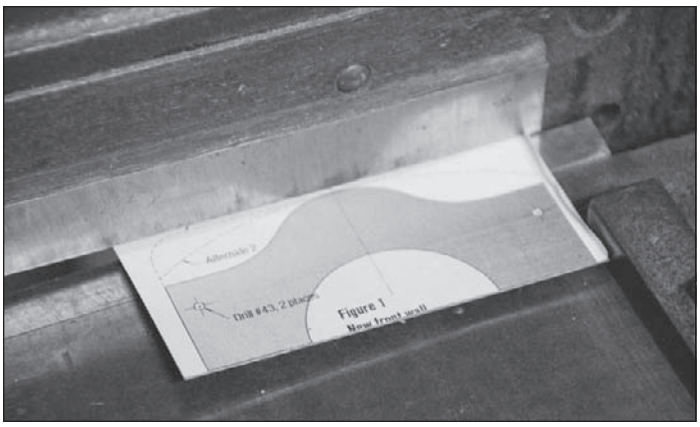


Photo 16

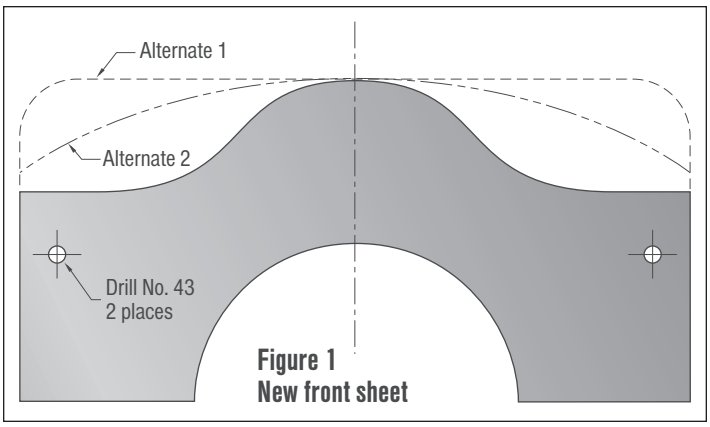


Figure 1

copy **Figure 1**. Make sure that it prints out at 100 percent — the part should measure 3.490-inches wide. Glue this directly to your material (**Photo 15**). I like spray glue, and use Krylon Easy-Tack No. 7020. Once the pattern is glued down, cut out the main shape on your shear or band saw (**Photo 16**). Smooth the outside edges if necessary, then drill the two holes for the braces (**Photo 17**). The curvy bits are best cut out with a jeweler's saw (**Photo 18**). Cut very close to the line, but not right on it, then finish up the cut with files. The finished piece, with the pattern removed, should look like **Photo 19**. (Note: **Figure 1** is just a suggestion for the shape of the back sheet. Two alternatives are also shown in the drawing (dotted lines) or you could just design your own.)

For the sheet mounts, cut two pieces of one-eighth-inch-square brass bar, each 0.750-inches long (**Photo 20**). Blacken one surface of each and mark them for holes, as per **Figure 2** (**Photo 21**). Drill the holes No. 51 and tap them 2-56. The finished parts can be seen in **Photo 22**.

Now the side tanks must be marked and drilled to receive the sheet mounts. If you've scraped all the paint off the top of the tanks like I did, blacken them with a marker and lay out the holes as per **Figure 3** (**Photo 23**). Drill the holes No. 43. Scrape off any burrs that might have been made inside the tanks, then screw the sheet mounts to the tanks, inserting

Photo 17

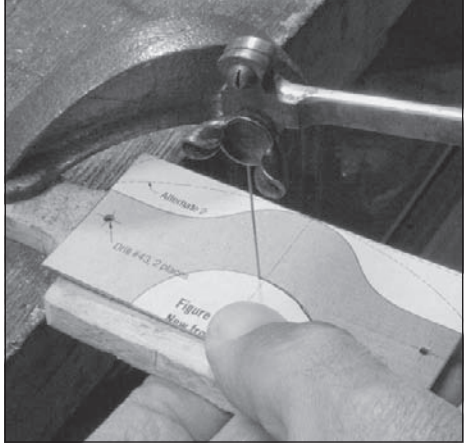


Photo 18

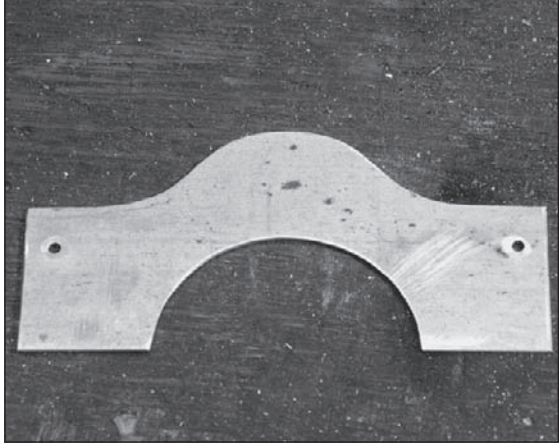


Photo 19

Photo 20

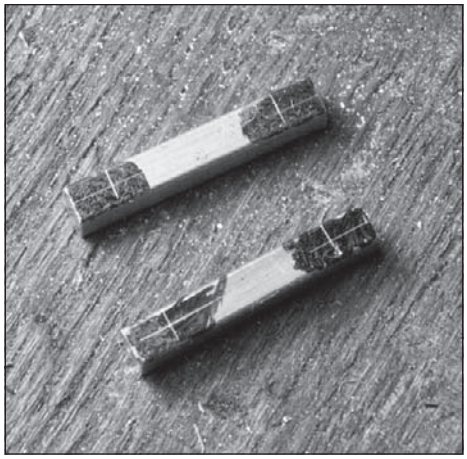


Photo 21

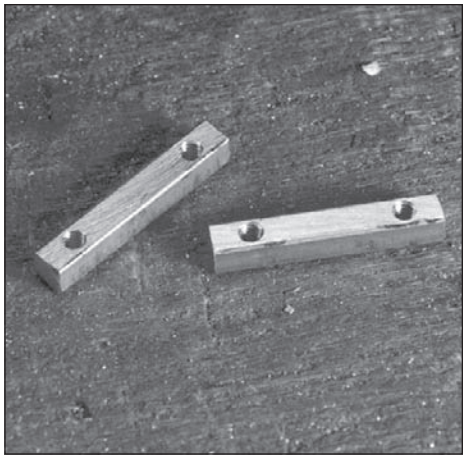


Photo 22

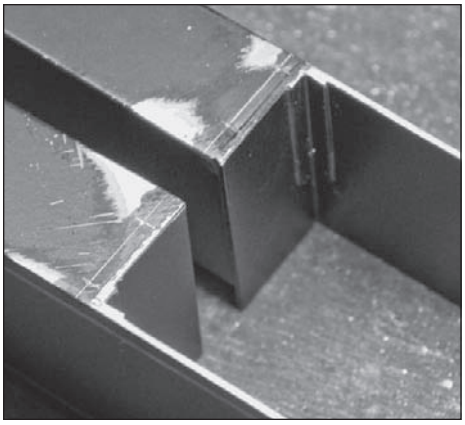


Photo 23

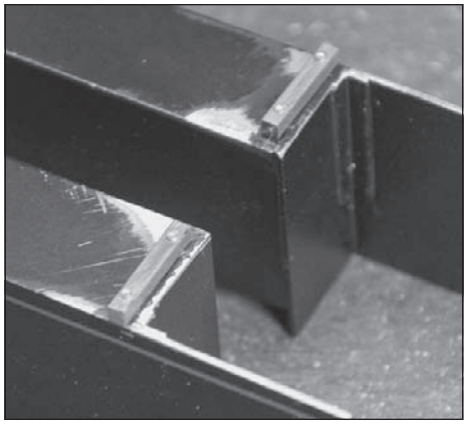


Photo 24

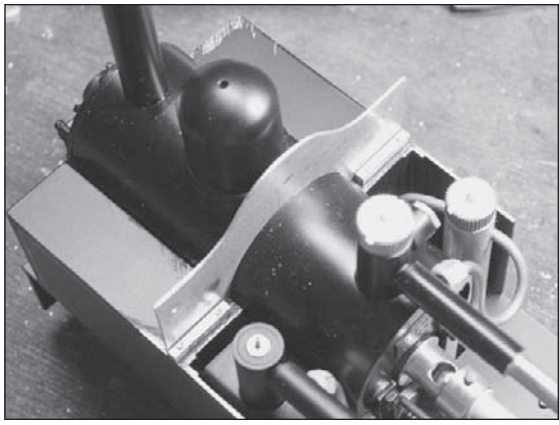


Photo 25

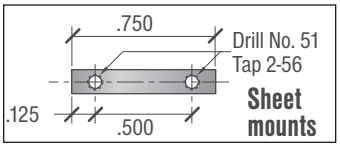


Figure 2

the screws from the inside (**Photo 24**). Remount the side tanks to the floor of the locomotive, using the single forward screw per tank, and temporarily place the new front sheet in position, just behind the dome and in front of the sheet mounts (**Photo 25**).

We're going to soft-solder the new front sheet to the sheet mounts with the parts in place on the locomotive. Put some flux on the mating surfaces, put the front sheet in position, being careful to align the edges properly, and clamp the front sheet to the sheet mounts with small clamps that can stand the

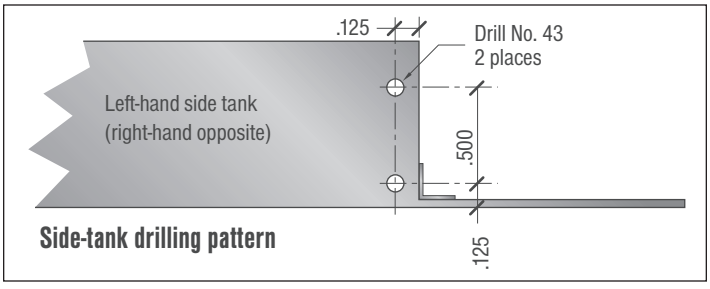


Figure 3

heat (**Photo 26**). Put a small piece of soft solder next to each joint, then heat each side of the assembly gently with a torch. Remove the heat as soon as the solder flows (again, don't worry about the paint). The

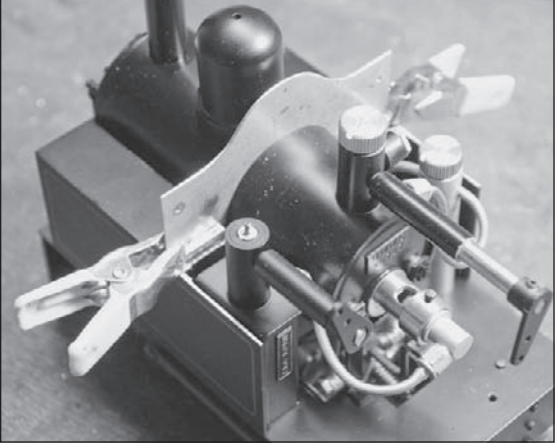


Photo 26

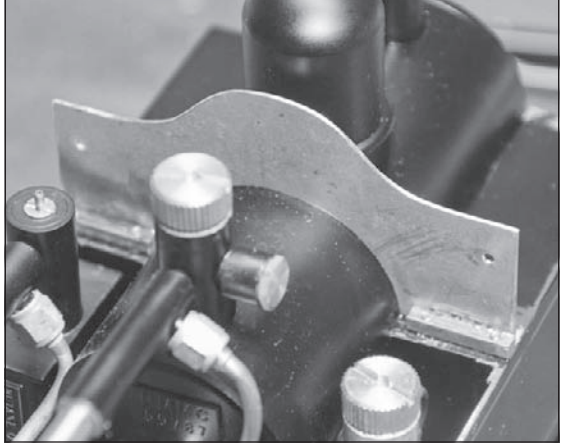


Photo 27

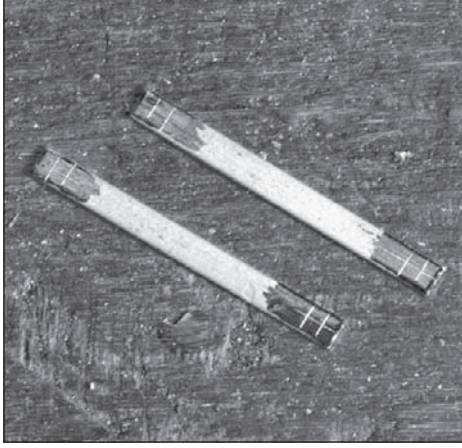


Photo 28

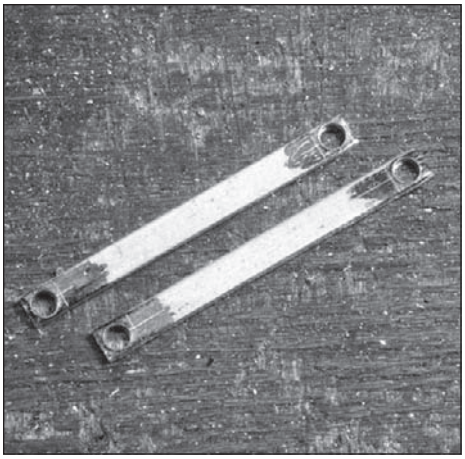


Photo 29

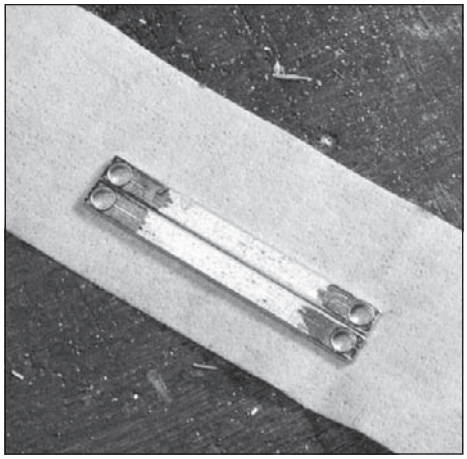


Photo 30

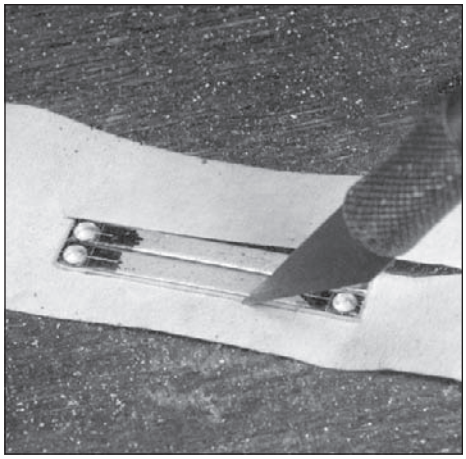


Photo 31

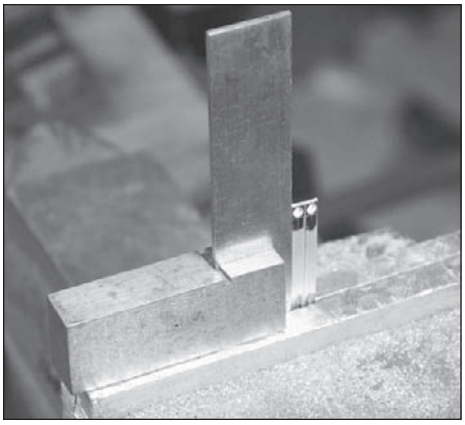


Photo 32

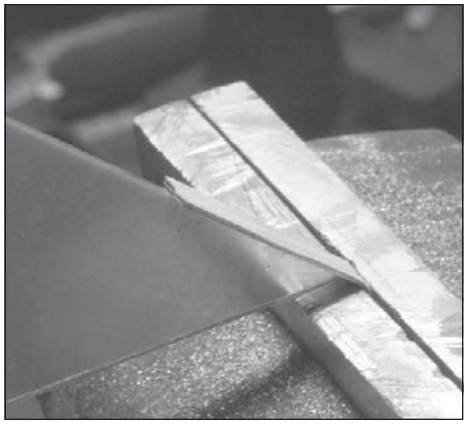


Photo 33

Photo 34

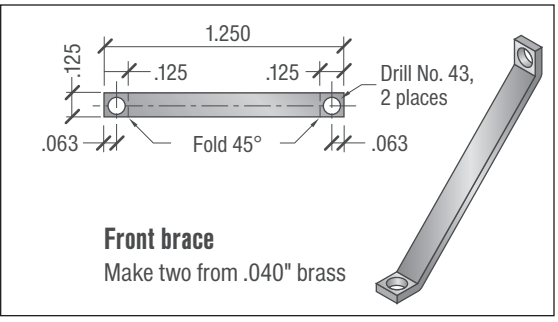


Figure 4

finished assembly should look like **Photo 27**. Set this aside.

The braces

Made of strap brass, the braces are 0.125-inch wide. Again, the thickness should be 0.040-inch to 0.060-inch or so. Cut two pieces to a length of 1.250-inch. Mark each piece for folding and drilling, as per **Figure 4** (**Photo 28**). Go ahead and drill the No. 43 holes. Clean up the backsides with a flat file. The parts should now look like **Photo 29**.

Stick the pieces to a strip of masking tape, exactly side by side (**Photo 30**). Trim away the excess tape with a hobby (X-Acto) knife (**Photo 31**). Place the taped pieces in the vise, with the fold line even with the top of the jaws. Use a square to ensure that the pieces are exactly perpendicular to the vise jaws (**Photo 32**). Carefully bend both pieces together to a 45-degree angle. Use a protractor or a 45-degree triangle as your guide (**Photo 33**). The finished braces should look like **Photo 34**.

Attach the braces to the front sheet (which should still be in place on the locomotive). Use 2-56 hex

Photo 35

Photo 36

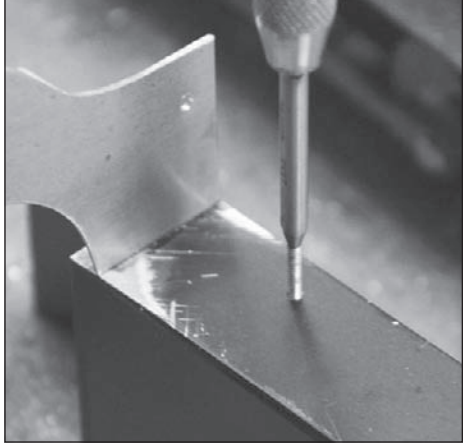


Photo 37

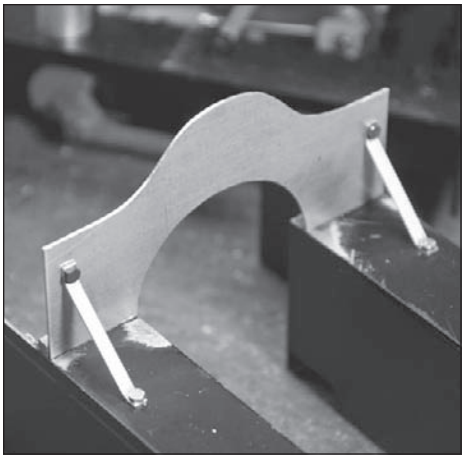


Photo 38

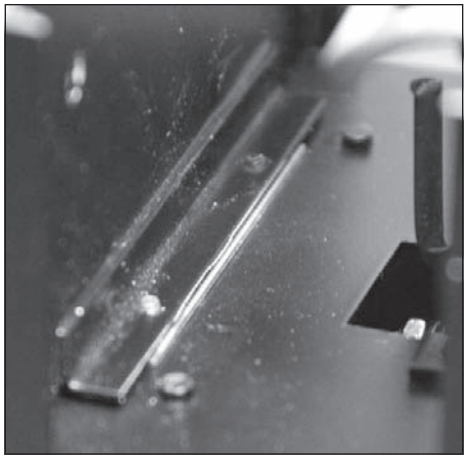


Photo 39

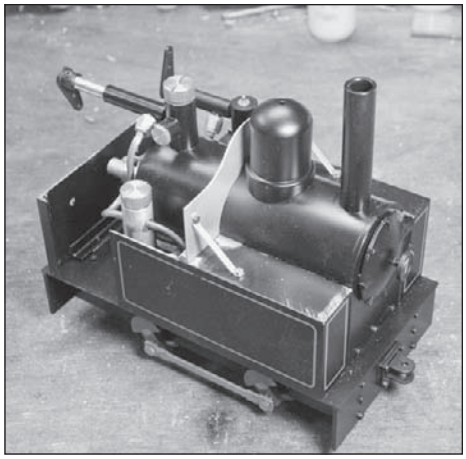


Photo 40

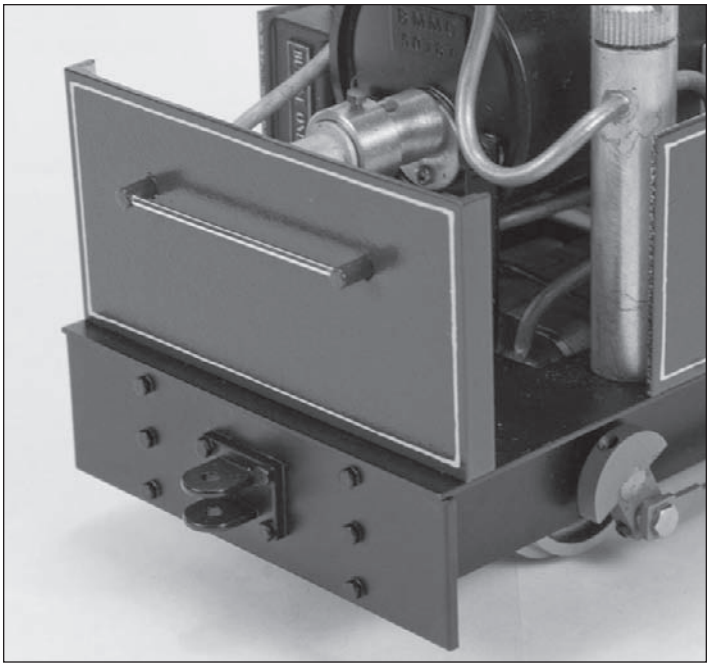


Photo 41

screws, with nuts on the inside (**Photo 35**). Make sure the braces are straight and that the unfastened end of each is the same distance in from the edge of the side tank as the other. Then, holding your No. 43 drill in a pin vise, rotate it by hand in the hole of the unfastened end just enough to leave a mark on the top of the side tank (**Photo 36**). Remove the side-tank/front-sheet assembly from the engine, remove the braces, center-pop the marks, then drill No. 51 holes. Tap the holes 2-56 (**Photo 37**). Screw the braces into place (**Photo 38**), then replace the assembly on the locomotive, fastening it with the two forward screws from underneath. Surprisingly, these two screws hold everything in place securely without need for more.

Replace the back sheet. You may find that, when you replace the back sheet and tighten the screws, it wants to lean forward. This is because the angle that engages the screws is not flush with the bottom of the sheet. I solved the problem just by placing a shim between the angle and the cab floor. It can just be seen in **Photo 39**. Once everything is in place and looking good, the mechanical part of the project is finished (**Photo 40**). All that remains is paint.

Since the cab is so open, taking a little care with the paint job will be worth it in the end. Also, you can replace the coal bunker or not, as you wish — I left mine off. However, I didn't like the mounting holes for the bunker that remained in the back sheet, so I decided to use them for a little extra bling. I made handrail stanchions that fit the holes and added a rail to the back sheet (**Photo 41**). Also, I shortened the throttle spindle, which was covered in *Steam in the Garden*, No. 131, January/February 2014. This needn't be so long on an open-cab engine, and it looks better being shorter.

Complete your collection!

Don't miss out — back issues for only $6 each

Vol. 25, No. 2; Issue 138; March/April 2015
Laser Loco: Scratch building with laser-cut brass. Part 1 • How steamers in Seattle created a community • Getting an LED onto the front of Accucraft's C-19 • Two former ride-on live steamers decide to go to Gauge One • Romance, realism of coal firing: factors to consider before taking the plunge.

Vol. 25, No. 1; Issue 137; January/February 2015
Expand Accucraft cylinder ports • Casey Jones: a new 10-wheeler from Wuhu and the engineer's history • R/C J-bar: adding steam controls to transmitter • Dummy cylinders: Give 'Dora' a more realistic look • Railroad librarian: 'Great American Railroad Stories'; 'The State Belt.'

Vol. 24, No. 6; Issue 136; November/ December 2014
Sacramento steams. The 2014 National Summer Steamup provides a fun time for more than 150 steamers • Replacing axles • Scratch-building the four-cylinder Heisler, Part Three • The backyard Rivendell & Midland Railroad, Part Two • 'Dora' gets a snow plow (and a bell and a ...).

Vol. 24, No. 5; Issue 135; Sept./Oct. 2014
A big little locomotive: Accucraft's 7/8ths-scale 'Fairymead' • Scratch-building the four-cylinder Heisler, Part Two • The backyard Rivendell & Midland Railroad, Part One • Build a train barn • Review: Regner's 'Otto' • Latest Waybill: Accucraft 1:32-scale rolling stock; end of boiler detection; new wheels..

Vol. 24, No. 4; Issue 134; July/August 2014
Scratch building the 1:20.3-scale, four cylinder Heisler (Part One of a three-part series). • Making Yankee-style cross heads and guides • Snowbound in Scranton — steamup almost canceled • Mysteries of abrasive water-jet cutting explained • A review of Regner's 'Max' kit locomotive.

Vol. 24, No. 3; Issue 133; May/June 2014
Steam on the Bayou: Diamondhead steamers get a chance to operate a full-size locomotive • Reviews of two Accucraft locomotives: Quarry Hunslet, S.P. M-6. • Adding a pressure gauge to your 'Dora.' • Origami for passenger-car vestibules. • New products: Three new engines from three manufacturers.

Vol. 24, No. 2; Issue 132; March/April 2014
Lowering 'Dora's' boiler (series Part Four) • Crafting a coal burner — scratch building a Colorado Consolidation • A clerestory roof (Part Two in heavyweight cars series) • Rivet Divot — make your own tool for adding metal details • Review of the book 'The Angola Horror' • New products: wagons.

Vol. 24, No. 1; Issue 131; January/February 2014
Review of Wuhu Bowande's 1:32-scale British A4 • Making 1:32-scale heavyweight passenger cars (series Part One) • Modifying 'Dora's' reverser lever (series Part Three) • Car carriers made from corrugated plastic • New products: Remote Control Systems, Regner, Accucraft.

Vol. 23, No. 6; Issue 130; November/ December 2013
Building Aster's Challenger • Hot trains, cool venue — National Summer Steamup sets up in a new hall • Steamup etiquette • Boiler bands — adding them to dress up your 'Dora' (series Part Two) • Backdating — Turning a D&RGW C-19 locomotive into East Broad Top's No. 7.

Circle the issue number of the back issue(s) you want delivered:

138	137	136	135	134	133	132	131	130	129	128	127
126	125	124	123	122	121	120	119	118	117	116	115
114	113	112	111	110	109	108	107	106	105	104	103
102	101	100	99	98	97	96	95	94	93	92	91
90	89	88	87	86	85	84	83	82	81	80	79
78	77	76	75	74	73	72	71	70	69	68	67
66	65	64	63	62	61	60	59	58	57	56	55
49	48	47	46	45	44	43	41	40	39	38	37
36	34	33	32	29	28	27	26	25	24	23	21
					20						

Number of issues circled _____ x $6 ..... $_____

U.S. first-class postage _____ x $1 ..... $_____

Non-U.S. postage _____ x $5 ..... $_____

Total payment ..... $_____

Name _____

Address _____

City _____ **State** ___ **Zip** _____

Country _____ **Phone** _____

Email _____

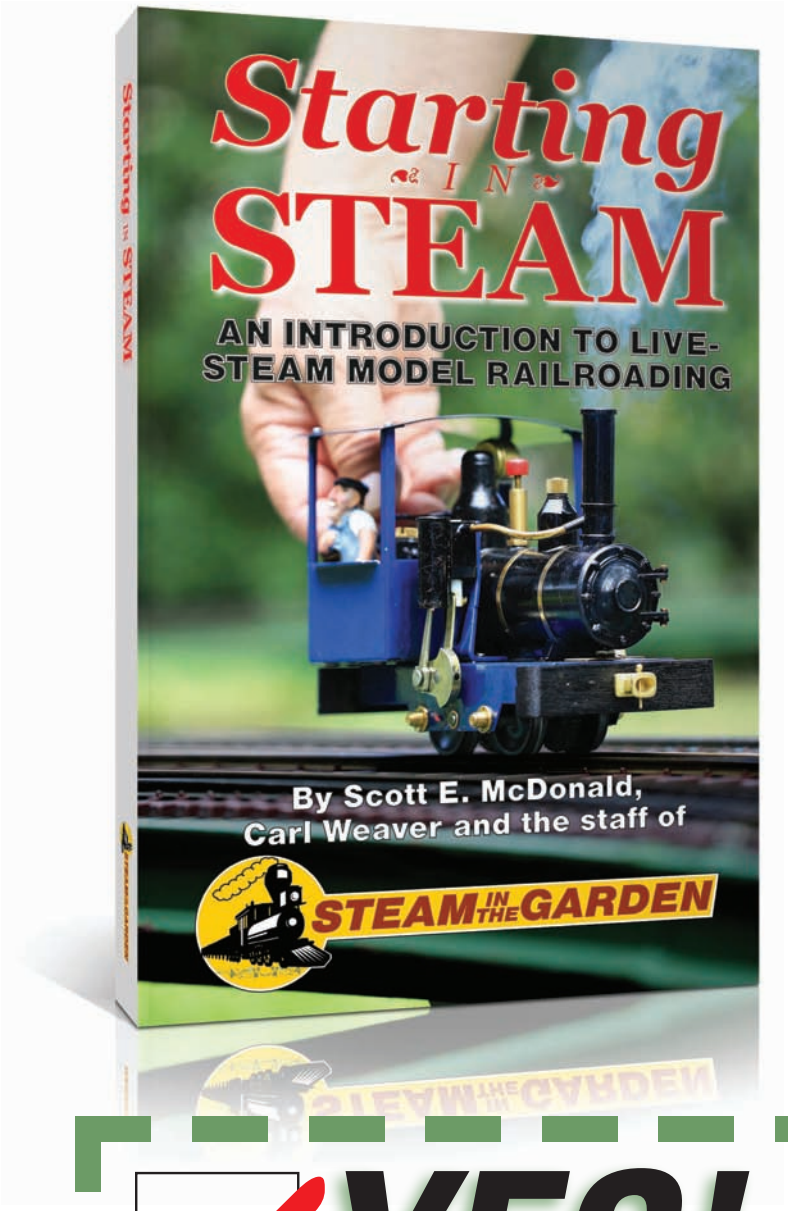
MC/Visa/Discover _____

Expiration _____ **Security code** _____

Signature _____

Mail to: *Steam in the Garden*, P.O. Box 335, Newark Valley, N.Y. 13811-0335. Or call Marie at (607) 642-8119 for bundled prices.
Also, you can visit http://www.steamup.com/back-issues/ for quick on-line ordering.

FUN TRAINING FOR TINY TRAINS



A BEGINNERS' GUIDE TO LIVE-STEAM MODEL RAILROADING

"STARTING in STEAM" is a new 174-page book designed to help not only small-scale live steam newcomers, but veterans as well. Written by the staff of *Steam in the Garden* magazine, this profusely illustrated book provides a wealth of information on how the locomotives work, how to run them, how to care for them and how to have fun with them.

"STARTING in STEAM" includes 10 chapters, with titles such as "Choosing your first locomotive," "Butane-firing basics" and "Getting help." Additionally, the book features an extensive glossary that addresses not only the specifics of live-steam model railroading but also general railroading terms such as "cylinder," "piston," "switch" and "Whyte notation."

"STARTING in STEAM" is available both in paperback and digital versions. The paperback retails for $9.95 in the United States and for a limited time we'll provide free shipping (Canada and overseas is higher). The digital version is $5.95 on the web site; single copies (as well as bulk purchases) are also available by calling (607) 642-8119.

http://www.steamup.com/starting/

YES!

I WANT TO LEARN MORE ABOUT LIVE-STEAM MODEL RAILROADING, INCLUDING HAVING TINY-TRAIN FUN.

Please send me a copy of the paperback book, *Starting in STEAM* for just $9.95 (includes shipping).

☐Canada/Mexico, $11.95 ☐Overseas, $17.95

Mail to: *Steam in the Garden*
P.O. Box 335, Newark Valley, N.Y. 13811-0335

☐Check enclosed* ☐Discover ☐MasterCard ☐Visa

Name _____
(Please print)

Address _____

City _____ State ___ Zip _____

Phone _____

Email _____

Card No. _____

Sec. Code _____ Exp. _____

Signature _____

*All checks must be drawn in U.S. funds on a U.S. bank. Your book should arrive in 6-8 weeks.

TIMETABLE

June 20-21, 2015 — Water & Rails Pond and Garden Railway Tour, Reno/Sparks, Nev. Self-guided tour of more than 30 Northern Nevada backyards, with garden railroads, miniature towns and koi ponds. Tenth anniversary event benefits ALS of Nevada, which supports of Lou Gehrig's Disease patients. Info: http://www.waterandrails.org or (775) 329-3041.

July 5-11, 2015 — National Garden Railway Convention, Crowne Plaza Airport Hotel, Denver, Colo. Self-guided and motor-coach tours of area garden railroads; clinics, vendor hall (50-plus expected), speakers, banquet, ice cream social. Steam layout provided by International Small Scale Steamup will be open for general use in vendor hall. Info: http://ngrc2015.com.

July 15-19, 2015 — National Summer Steamup, Lions Gate Hotel, McClellan, Calif. Multiple layouts, more than a dozen loops, 38,000-square-foot steamup hall; open 7 a.m.-1 a.m. Clinics, dealers' room, door prizes, swap tables, Saturday night BBQ. Lions Gate room reservations: (916) 643-6222 (http://www.lionsgatehotel.com). Info: http://www.summersteamup.com or (650) 898-7878.

Sept. 2-5, 2015 — Thirty-fifth National Narrow Gauge Convention, Royal Sonesta Galleria Hotel, Houston, Texas. Layout tours, modeling contest, modular layouts, more than 30 clinics, almost 70 dealers. Info: http://www.nngc-2015.com.

Sept. 17-20, 2015 — Fall Steamup, Staver Locomotive, Portland, Ore. Info: http://www.staverlocomotive.com.

Jan. 10-17, 2016 — 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.

Feb. 12-14, 2016 — 18th Annual Presidents' Day Steamup, Electric City Trolley Station & Museum (Steamtown), Scranton, Pa. Info: Clem O'Jevich Jr., (570) 735-5570 or wrunloco@aol.com.

Regular steamups

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.

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

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. Info: Earl Martin (916) 773-0933, emartin187@aol.com.

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

Advertiser index

BOWANDE

博万德

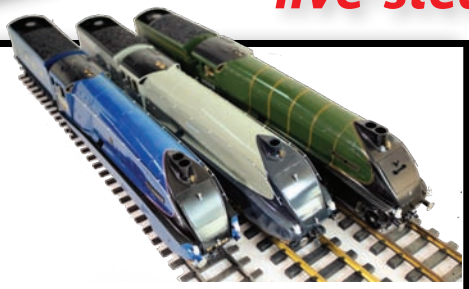
Wuhu Brand Arts & Crafts Co., Ltd

Represented in the United States by
Bob Clark, Stoke 'm & Smoke 'm, (301) 467-3348
U.S. service and support provided by
Charles & Ryan Bednarik, Triple R Services
(609) 280-8744, www.realsteamservices.com

A complete line of small-scale, live-steam locomotives

BRITISH A4

1:32-scale, G-gauge (45mm)
live steam



BRITISH A4

1:32-scale, G-gauge (45mm)
live steam

BRITISH BLACK 5

1:32-scale, G-gauge (45mm)
live steam

BRITISH 8F

New ceramic burner 8F

1:32-scale, G-gauge (45mm)
live steam

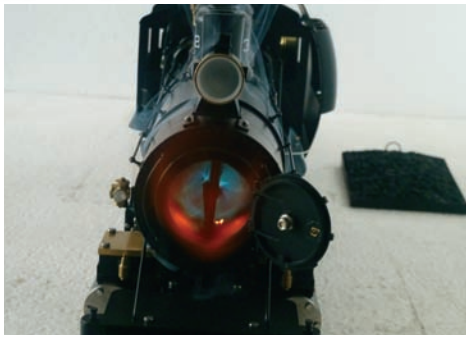
GERMANY BR41 — Small deflector

1:32-scale, G-gauge (45mm)
live steam

GERMANY BR41 — Big deflector

1:32-scale, G-gauge (45mm)
live steam

U.S. 'Casey Jones' ICRR No. 382



U.S. FALK

Limited to 100 sets released worldwide

1:20.3-scale, G-gauge (45mm)
live steam

U.S. PORTER

Limited to 200 sets released worldwide

1:20.3-scale, G-gauge (45mm)
live steam

For more information, visit our web sites: http://www.bowandeusa.com
http://www.bowandedirect.com *http://www.bowande.en.alibaba.com*

Wuhu Brand Arts & Crafts Co., Ltd
Tel: 0086-553-2866713
Fax: 0086-553-2866713
E-mail: Wuhubowande@126.com
www.bowandeusa.com
www.bowandedirect.com www.bowande.en.alibaba.com

博万德®

BOWA E

Pennsylvania RR's G5

A 1:32-scale, butane-fired 10-wheeler

Reservations accepted

The Pennsylvania Railroad needed a more powerful engine for commuter trains, with their many stations and tight schedules. The G5 4-6-0 was developed to handle heavier trains — both passenger and freight — that the typical 4-4-0 could not. The G5s were built between 1923-1925 at the railroad's Altoona shops in a batch of 50, numbered 5700-5749 for the Pennsy; another batch of 31 were built for the Pennsy subsidiary, the Long Island Railroad (they were numbered 20-50). These engines were used through until the end of steam in the mid-1950s.

New! Two Editions!

The PRR G5 and the Long Island RR G5 have both had pilot models built and tested. The locomotives will be 1:32-scale, G-gauge (45mm), butane-fired with ceramic burns, and will include two cylinders and operate at 60psi. The engine will be 27¾-inches long, by 4⅛-inches wide by 5¾-inches tall (705mm x 105mm x 146mm) and be able to negotiate a 78¾-inch radius (2 meters). The PRR G5 models will be numbered 5741 and 5748, while the LIRR G5 engines will be No. 28. *Reserve your steamer today!*

China's 'Big Boy' — The QianJing

2-10-2 engine built in China, prototypes still running in USA

The first high-powered locomotive designed and built in China, the QianJing production run ended in September 1956 after 4707 units had been made. No. 7207 was the last of the QJ to run in China, retiring in December 2005. Five of the engines were sold to U.S. railroads and three are still used in excursion today. Its 2-10-2 wheel arrangement naturally makes it China's "Big Boy."

Bowande Wuhu will show its 1:32-scale pilot of the QJ at the International Small Scale Steamup at Diamondhead, Miss., Jan. 11-18. Reservations will be taken after pilot testing.

The QJ will come in both butane- and coal-fired models (ceramic burner for butane), with two three-quarter-inch by one-inch cylinders (18mm by 25mm) and two-inch driver wheels (46.8mm), with boiler working pressure at 60psi. Including the six-axle tender, the locomotive will almost be 36-inches long (911.9mm); with the four-axle tender, 32-inches long (813.2mm). Both will be 4⅛-inches wide by 5⅞-inches tall (105.5mm by 149.7mm). Minimum radius will be 78¾-inches (2 meters). Number options will include 6988, 6998, 7002, 7040 and 7081.

Our U.S. Agent: Stoke 'm & Smoke 'm, Bob Clark, (301) 467-3348
U.S. after-sale support: Triple R Services, Charles & Ryan Bednarik
(609) 280-8744, www.realsteamservices.com

Aster Hobby USA LLC

125 Fairgrove Trail Campobello SC 29322 USA
Tel: 864 587 7999 Fax: 864 587 2299
Web: www.asterhobbyusa.com Email: service@asterhobbyusa.com

Exclusive U.S. importer and distributor for Aster live-steam locomotives and accessories

If your passion demands 1/32-scale live steam models of highest precision, aesthetic presentation and prototypical functionality, look no further than Aster. All locomotives are designed and manufactured by Aster Hobby Co. Inc. of Yokohama, Japan.

Union Pacific FEF-3s No. 844 & No. 837

Now in production for end of April 2015 release. Locomotive No. 844 will be produced in black only. The Greyhound version will be No. 837. Kit price is projected at $7700 for the black and $7900 for the gray version. Ready-to-run prices are $9300 for the black No. 844 and $9700 for the Greyhound No. 837. For additional information, visit our web site:

www.asterhobbyusa.com

Pilot models shown; subject to alterations and modification.

Great Northern S2 kits

In stock for immediate delivery. Price now $6900. You will not be disappointed with the performance and appearance of this easy to assemble and operate locomotive kit. More pictures and technical specifications are posted on the web site: **www.asterhobbyusa.com.**

Authorized dealers

Bear Creek Railroad
Surrey, B.C., Canada V4P 1P7
Tel.: 604-535-2454
Email: pantages@telus.net

Quisenberry Station
Alexandria, Va. 22309
Tel.: 703-799-9643
Web: quisenberrystation.com

Southern Steam Trains LLC
Travelers Rest, S.C. 29690
Tel.: 864-834-3954
Web: southernsteamtrains.com

Gauge One Lines
Stittsville, Ont., Canada K2S 1P8
Tel.: 613-836-6455
Email: gaugeonelines@yahoo.com

North Jersey Gauge One Co.
Park Ridge, N.J. 07656
Tel.: 201-391-1493
Email: bob1027jane@aol.com

Still available: Thunderbolt, Baldwin Tank, Krauss Tank

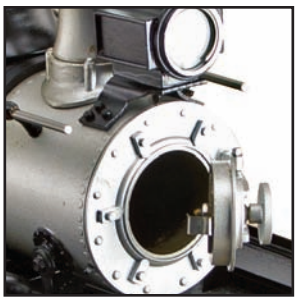
ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

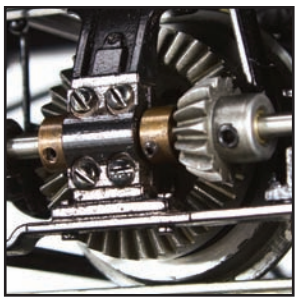
28-TON CLASS B SHAY

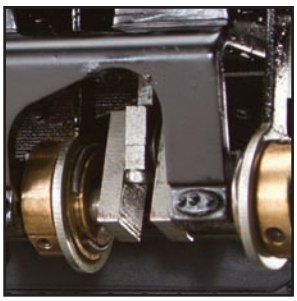
Brass & Stainless Steel

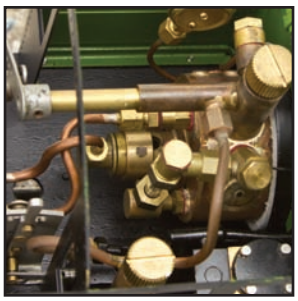
Butane Fired, Live Steam

1:20.3 Scale









www.accucraft.com