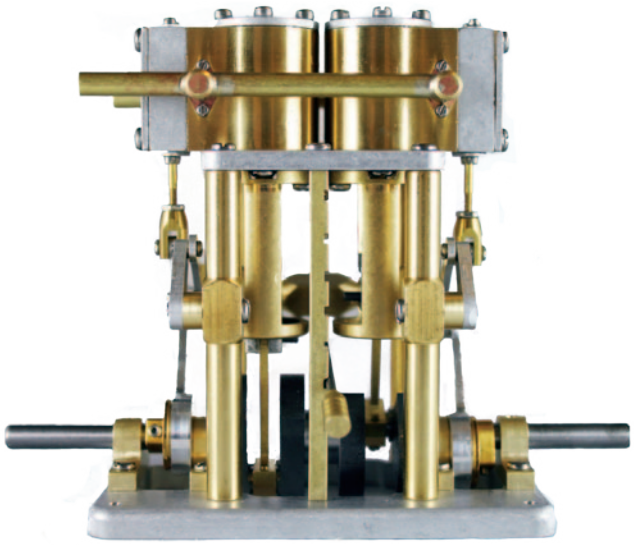
No. 171, January/February 2021 US $5.95
Canada $7.95

# STEAM IN THE GARDEN

# Completing the Blue Comet

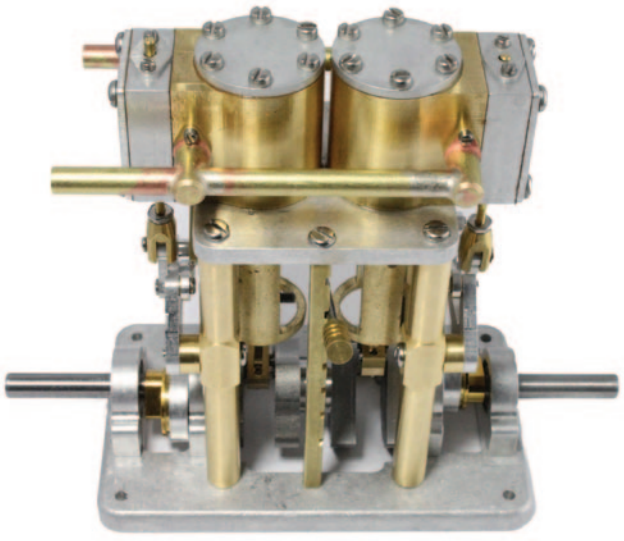

* Minitram Build Project
* New Build Series - Freelance Consolidation
* Accucraft 7/8ths Coal Fired Forney Review
... and lots more!

# 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

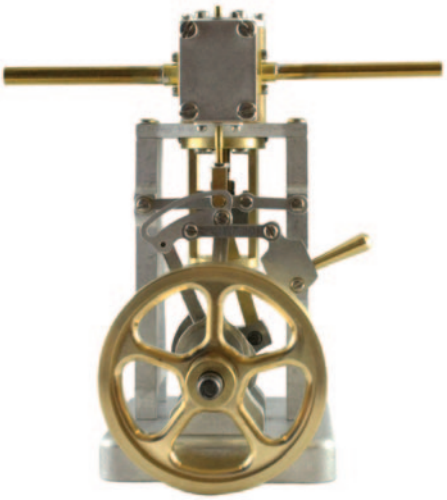
Ready to assemble steam engine kit: $295
Fully assembled and tested: $400
Includes all hardware
SAME AS TVR1A but with shielded ball bearings
Includes full-color assembly manual
Dimensions: Same as TVR1A
Weight: 323 g

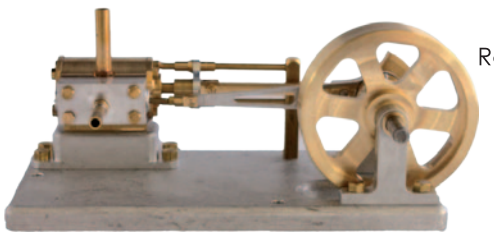
## Flywheels for TVR1A / TVR1ABB

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

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

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





## HM1

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

## VR1A

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

---

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)

Call Bob @ 301-467-3348

# Stoke 'm & Smoke 'm

www.LiveSteamG1US.com

**U.S. Agent for sales and service Bowande Wuhu Live Steam**




Pennsylvania RR G-5 4-6-0
Only As Delivered version still available.

RUSSIAN DECAPOD 2-10-0
One Frisco and very few WM still left.

1898 Rogers Built 4-6-0ICRR No. 382
Casey Jones' engine. Very Few Left!

The new Pennsy Milk Train reefer together with the Pennsy Combine Behind a G-5 Engine for an accurate late 1940's to early 1950's train.

**Please call/contact us for engine combo specials and engine & car combo specials!!**

# 'DAVENPORT'

**Live steam 16mm : 1 ft scale saddle tank locomotive**

*Internal gas firing.
*Outside framed 0-4-0 chassis with Roundhouse internal Walschaerts valve gear.
*Exhaust enhancer.
* Water top-up system and water gauge.
* Glazed cab spectacles.
* Radio or manual control.
* Gauge adjustable between 32mm and 45mm.
* Optional insulated wheels available.
* Available with a choice of matt black or gunmetal smokebox, matt black or red oxide roof and bodywork in any standard Roundhouse colour.

**Roundhouse Eng Co Ltd.**
Unit 6-10 Churchill Business Park,
Churchill Rd, Wheatley, Doncaster,
South Yorks, DN1 2TF
***Tel*** - 011 44 1302 328035
***E-mail*** - mail@roundhouse-eng.com
**www.roundhouse-eng.com**

ROUNDHOUSE

# SOUTHERN PACIFIC AC-9 2-8-8-4 YELLOWSTONE

## NOW ACCEPTING COMMISSIONS FOR THE AC-9 PROJECT

**AC-9 features include:**

- 3D-modeled cast pilot and front-end details.
- 3D-modeled cast skyline casing.
- Cast front- and rear-frame extensions.
- New all-weather cab with cast details.
- Axle-pump bypass out of cab.
- Tuned tracking and suspension.
- Multiple bearing cross heads.
- Lighting package includes pressure gauges.
- Convert your Accucraft AC-12 or RMC can provide one for conversion.
- Butane fired.
- Modeled in early 1950s time frame — just before oil conversion.
- Tender modified/detailed for 1950's coal firing.

AN RMC CONVERSION PROJECT IN CONJUNCTION WITH TRIPLE R SERVICES

PRODUCTION LIMITED TO 10 UNITS:

**ONLY 1 OPENING LEFT. RESERVE YOURS NOW!**

WANTED: LIVE STEAM CAB FORWARDS IN RUNNABLE CONDITION.

## CAB FORWARDS by RMC

518-798-0080 OR 518-791-0220 (CELL) ALAN_REDEKER@ROADRUNNER.COM

ALAN REDEKER: LIVE STEAM CAB FORWARD CONVERSIONS & SALES

# TRIPLE R SERVICES

*Services To Enhance Your Steam Experience*

- Locomotive in need of a good overhaul or lacking performance?
- Locomotive kit unfinished or collecting dust?
- Welsh Coal **IN STOCK**. Grains and Beans sizing. Contact us for pricing and information.
  - **Aster kit building**

    Accepting reservations to build the upcoming Aster models:

    - LSWR Adams Radial Tank and LNER/BR B1 4-6-0 in both kit and RTR forms.
    -Special pricing available on Mikado and 5MT kits.
  - **Custom-built track frames**

    Contact us for a quote on your track frame
  - **Castings Available**

    -Aster Marker Lights, Headlights, and other reproduction parts available in ***bronze***

    *-Exact reproductions of long unavailable parts!*

    -New castings added regularly. Contact us if you have a specific request.

**TRS is now a preferred dealer for Aster/Accucraft products.**

***Contact us for job scheduling or a price quote***

**Charles and Ryan Bednarik**

231 Rutland Ave.
Mount Holly, NJ 08060

**tr3services@gmail.com**
**www.realsteamservices.com**

(609) 280-8744
(609) 267-0769

Vol. 30 No. 5; Issue No. 171; January/February 2021

# STEAM IN THE GARDEN

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

**Editor** ..... Scott E. McDonald
**sitgeditor@gmail.com**
**(703) 490-9867**

**Associate Editor**.....Gary Woolard
**garishw2@earthlink.net**
**(310) 880-1369**

**Advertising Manager** ..... Sonny Wizelman
**sonnyw04@gmail.com**
**(310) 558-4872**

**Circulation Manager** ..... Marie Brown
**circ@steamup.com**
**(607) 642-8119**

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

Copyright © 2018, **Steam in the Garden LLC, All Rights Reserved. The contents of this publication may not be reproduced in whole or in part by any means without the express written consent of the publisher.**

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 Scott McDonald**
**Paul Scheasley Sonny Wizelman**

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

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

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

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

**http://www.steamup.com/**



**Cover:** Bill Allen's "Blue Comet" plying the circuit on his elevated railway.

**Photo by Bill Allen**

**Also inside:**

## LATEST WAYBILL

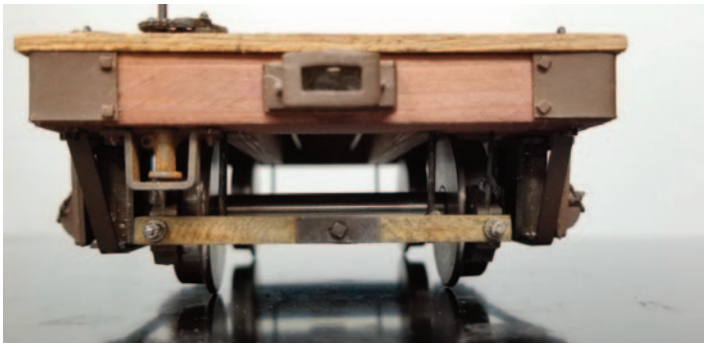
**Roundhouse Engineering, Doncaster, UK - New model locomotive announced for 2021.**


*Roundhouse Engineering Photo*

A full render of Roundhouse's Small England locomotive, shown here as Palmerston. The chassis work is complete, the boiler has been made and the first test batch of brass etchings are on their way.

Orders are not being taken until New Years Day so you still have a few days to wait before their order books open on this loco. They will be accepting orders by email as the office won't be open until the 4th January 2021.

**The Train Department - Hazlet, NJ - Munger Mining Equipment Update**



One of the items TTD wanted to bring back to production were the Gary Watkins Munger Mining lineup in 1:20.3 scale. Shown here is their upgrade of the car. This item is a very close copy of Gary's generic car. New castings were developed along with using originals from the original molds. Lettering will consist of the option of just a car number, a M-number and Maint Dept number spelled out with a number just as originally produced.

These cars are being built to order and can be custom numbered or lettered with your Railroad initals.

The wood parts are all saw cut in house of all straight grain old growth cedar. All wood is stained to suit with castings painted or blackened.

One big upgrade is to swap the pedestal binder from a 3 pc white metal casting to a strip of steel lasercut. It is bolted with miniature lags to the frame. This also gives a much stronger frame bottom in case of a derailment.

Keep an eye on the website for an announcement of pricing and costs.
*www.thetraindepartment.com*.

**Accucraft , Union City, CA** - Production photos of the first unit off the assembly line for Accucraft's 1:19 scale offering for 2021, Talylln Number 1 were released on social media. TR No.1 is now in full production and delivery is expected to have already begun by publication of this issue of *SitG*. This unit's production is based on the drawings provided by Deve Fletcher. The photos show Number 1 in its black livery. Contact Accucraft to place your order. *http://www.accucraft.com/*

**Specifications**

**Scale:** 16mm to 1 foot (1:19)
**Gauge:** Either 32mm or 45mm
**Min Radius**: 1.0M (36 ins)
**Length**: 286mm (11 ins) over buffer heads
**Width:** 88mm (3.5 ins)
**Height**: 136mm (5.5 ins)
**Weight**: TBA
**Boiler**: Centre Flue
**Working Pressure**: 60psi
**Reversing Gear**: Piston type, reverse by lever in the cab
**Fuel**: Butane Gas
**Boiler Fittings**: Safety valve, pressure gauge, water gauge.
**Cab Controls**: Steam regulator, gas regulator, reverser, lubricator. boiler blow-down.

# G Scale Junction

740-967-7300

326 S. High St. Pataskala, OH

PO BOX 321 PATASKALA, OH 43062

HOURS: STORE CURRENTLY OPEN ONLY 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

S20-9G MONA #5 $1,990.00

1/20.3

DORA 0-4-0 - $449.95

28T 3-CYL. SHAY-$2250

1:13.7 EMMA 0-4-0-$985.95

NEW PENNSY E-6 4-4-2

ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

BUTANE OR ALCOHOL
$2939 BLACK
$3129 GREEN LINED

1/32 C&O CABOOSE $439.95


1/32 SCALE

N&W J-CLASS #611 - $5816

ALLEGHENY 2-6-6-6 -$6844

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

C&O OR VIRG


NEW 1/32 HOPPER $104.50

1/32 REEFERS $100.50

PASSENGER CARS - $293.95

AMS
TRUE TO SCALE

AMS 1/20.3 ROLLING STOCK

LOGGING DISCONNECTS $78.50
SHORT LOG CAR $85.69
FLAT CARS $115.29
TANK CARS OR REEFERS $129.95
BOX CARS $143.95

AML

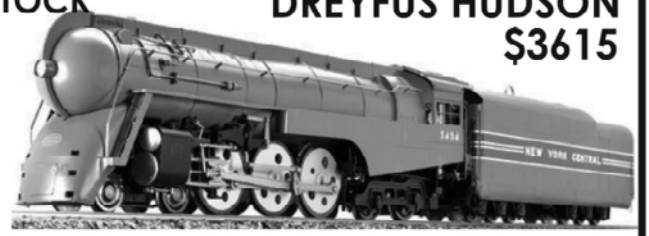
1/29 LOCO'S & ROLLING STOCK



WOOD REEFERS-$118.95

PS-1 BOX CARS-$98.50

DREYFUS HUDSON
$3615




6' FLEX TRACK CODE 332 (12 PC): ALUMINUM-$169.95 + SHIPPING BRASS-$395.00 + SHIPPING

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

BACHMANN QUALITY SINCE 1870 · Spectrum

1:20.3 FREIGHT CARS IN STOCK

LGB · USA TRAINS · Kadee · HARRIMAN LOCOMOTIVE WORKS HLW La Porte, Indiana · ARISTO CRAFT TRAINS

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 7/8-2016


# Accucraft Coal Fired 7/8ths Forney

Text & Photos by Rob Lenicheck

I'm used to running 1:20.3 coal-fired engines so I'm familiar with the big stuff. But this new 7/8ths-inch scale coal-fired Forney from Accucraft is a big beast to say the least! For those unsure of why this small profile engine is so large it's another one of those "scale versus gauge" understandings so unique to our Gauge One hobby: this engine's size is derived from the fact that we are trying to simulate the correct scale which should run on two foot gauge track, the track gauge of the prototype. Since our track gauge never changes, that, in turn, forces the motive power to change size to match the simulated track gauge.

The engine is 22 inches long by six inches wide and nine inches high and weighs in at a hefty 24 pounds. (Time to start your weightlifting program!) Accucraft has already released their butane version of this loco and Eric Schade did a great writeup of it in *Steam in the Garden, July/August 2020, Issue No. 168*.

I won't go into the heritage of this engine as Eric has already provided quite an extensive history in his writeup. I had a chance to review and fire Accucraft's coal-fired version of the Wiscasset, Waterville and Farmington RR No.9. I found the engine nicely detailed and very much true to the flavor of the prototype. The fit and finish was up to the standard we currently expect from Accucraft.

One of the interesting oddities Accucraft included on this engine became evident as I removed

the top of the well-built, wooden shipping box. What looked like a secondary smokestack directly in front of the engineer's side of the cab I learned is a prototypical muffler for the vacuum brake system. Although the muffler on the model is an empty can when looking at it from the top, I'm sure that it must have been filled with some sort of sound dampening material which you might want to simulate somehow. (See **Photo 1**.)


*Photo 1*

Accucraft has included some tools and parts necessary for either running or detailing. From left to right in **Photo 2**: tender pump handle, Goodall boiler plug, cosmetic whistle, cosmetic safety valves, whistle activation rod and coupler pins (in bag), two hex wrenches, a truck-mounted coupler pocket (which can be mounted to the provided threaded holes on the trailing truck), two plastic syringes for water and oil, and a coal shovel, pick and flue brush (not pictured).

A couple of challenges come up when placing the cosmetic whistle onto the top of the steam dome. The base of the whistle is threaded M3X0.5, likewise the threads in the dome. However, both of these threads have been painted. As a result, the whistle could not be threaded into place without first chasing the threads in the dome with an appropriate tap. Secondarily, the whistle activation lever needs to be temporarily bent up and out of the way while inserting the whistle and then bent back down into its original condition when in place. This must be carefully done so that the lever is not broken off. After the whistle is in the cosmetic safeties can then carefully threaded in – these were threaded in without a problem.

A couple of other caveats: while it is easy to pick up the engine using the smokebox and rear buffer beam one must be careful not to unintentionally grab the brake beam for lifting at the rear (**Photo 3**). It's a nice detail but is somewhat fragile. Also,


*Photo 2*

the steam dome houses the safety valve, as is the tradition in most cases. While the safety worked quite well in the trial steamup it was not obvious how to get to the safety off if it needs to be serviced. It turns out that the dome is secured with a small setscrew which, after disengaging the cosmetic piping, can be loosened to release the steam dome.

As one might expect, a coal-fired engine is more complex than a gas-fired. There are several additions and changes which must be designed and incorporated. While a butane boiler with a radiant burner can be built very much like a coal boiler, a coal fired boiler must have provisions for a grate and ashpan. For the complete coal neophytes out there the grate and firebox area is totally open to the outside when looked at from the bottom of the firebox. It's just a big hole into which the grate is inserted and on which the coal sits. The grate is usually slotted or otherwise made so that air can flow through it from beneath – this is what allows the coal to burn.

The boiler itself must be correctly designed so that the gases from the coal are provided a balanced airflow into the smokebox through a set of tubes. The number and size of the flues are based


*Photo 3*

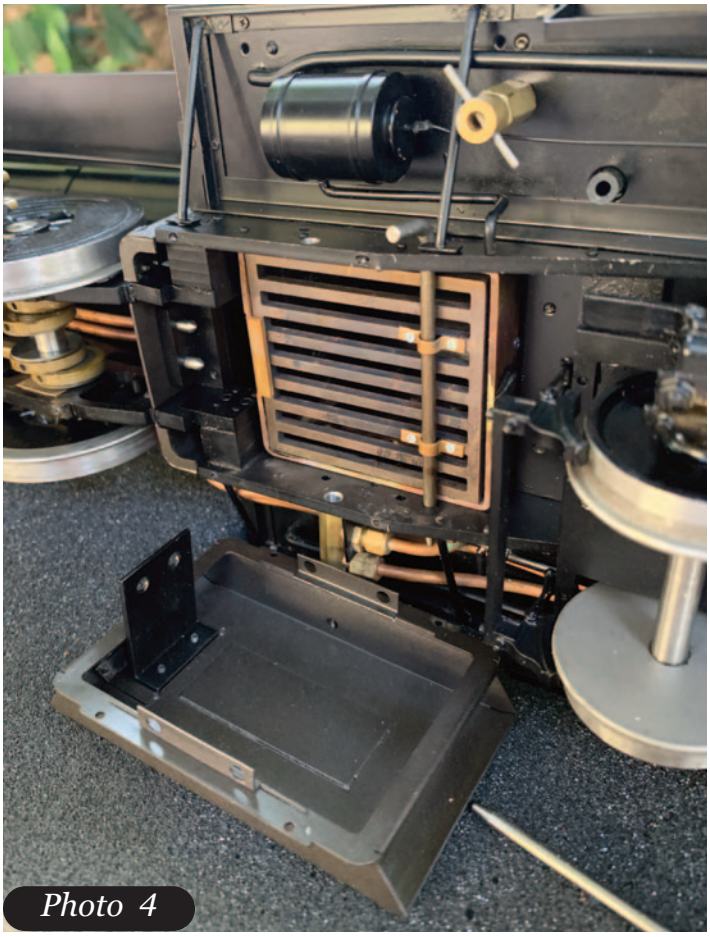


Photo 4

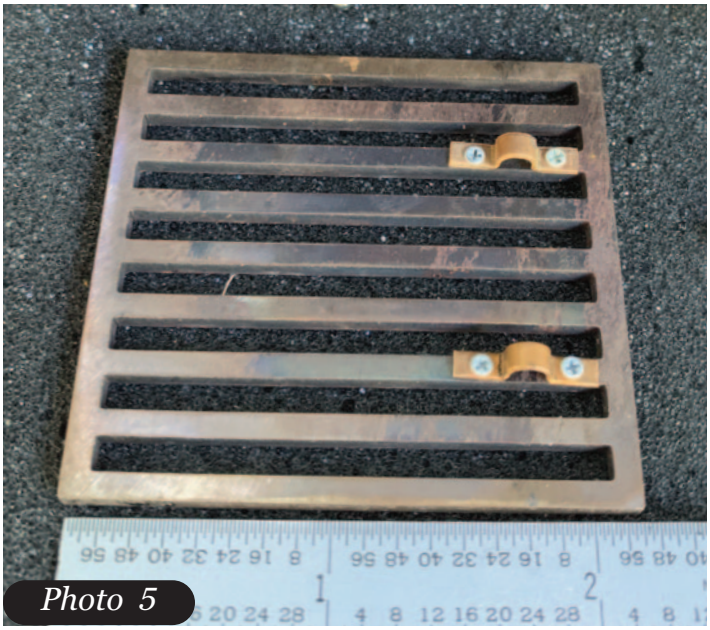


Photo 5

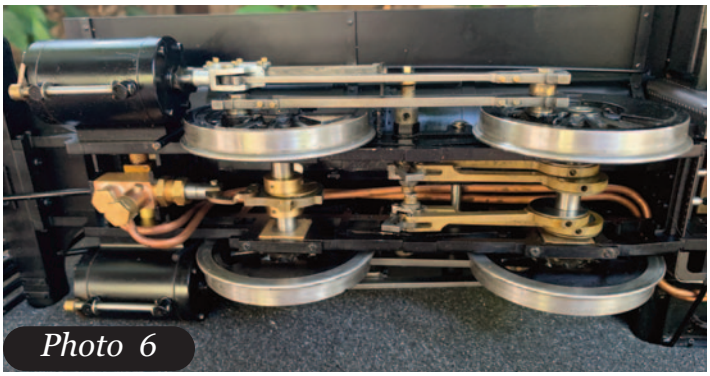


Photo 6

on empirical design standards established through many years of experience dating back to the turn of the twentieth century. In other words, the single flue boiler used with the traditional poker burner cannot be adapted for burning coal. It is a completely different boiler.

The grate and ashpan are of particular interest in this engine; they have been improved since an initial overview several months ago. There is now a set of two separate pins which hold each in place. **Photo 4** shows the grate still in place while the ashpan with its pin has been removed. The two pins at the front of the firebox are what locates the ashpan along with its own pin.

One of the keys to coal burning nirvana is having a grate area and firebox depth which are as generous as possible. The size of this engine helps with that in that the grate measures 2 3/16 inches X 2 inches with a thickness of approximately 3mm. In addition, the firebox is 1 5/16 inch deep (**Photo 5**).

Other components for burning coal which need to be present include an axle pump, blower, tender pump, a sealed smokebox and a correctly designed blast pipe. This engine delivers on all of these. Furthermore, other nice design items include a full Stephenson valve gear, a reverse lever with notches, slide valves, and cylinder cocks, and a 6mm diameter sight glass (as opposed to the normal 5mm) with blowdown valve. **Photo 6** shows a view of the underbelly of the locomotive showing the full Stephenson valve gear and axle pump driven off of the lead driver.

When I first saw this engine several months ago I was concerned about some basic design flaws which I thought needed to be addressed. A major one was that the top of the water bunker did not allow coal to be delivered to the firebox unless you were very lucky. The bunker needed to be cut back at an angle to let the shovel get to the door. Secondly, the grate and ashpan could not be removed unless the engine was turned on its side. This would force things to get really messy really quickly when you're talking about dealing with the ash and coal remaining after a run. Finally, the throttle stem needed to be extended out of the back of the cab so speed could be adjusted on the fly without having to lift the roof.

To their credit, Accucraft listened to the sugges-

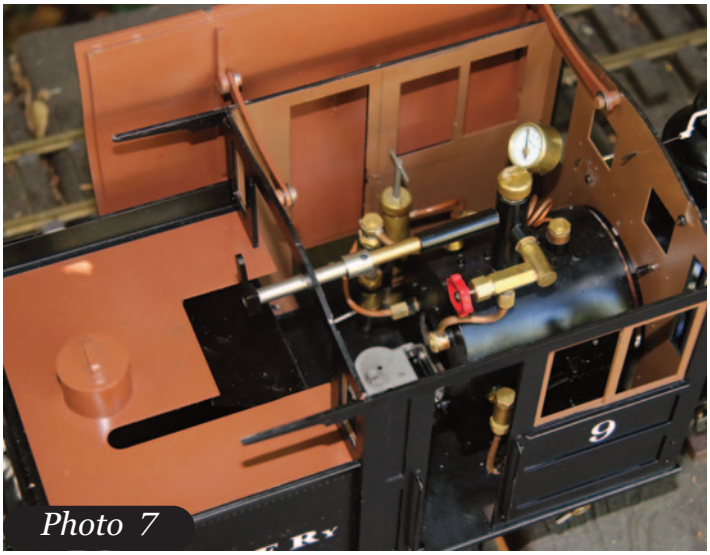


Photo 7

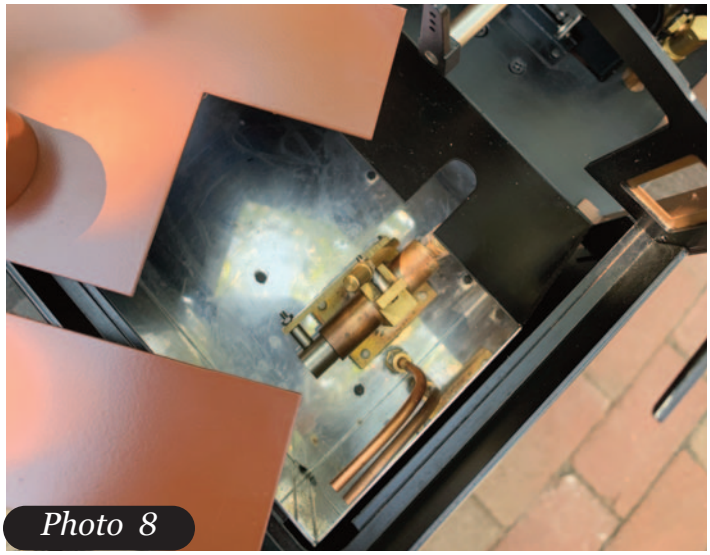


Photo 8

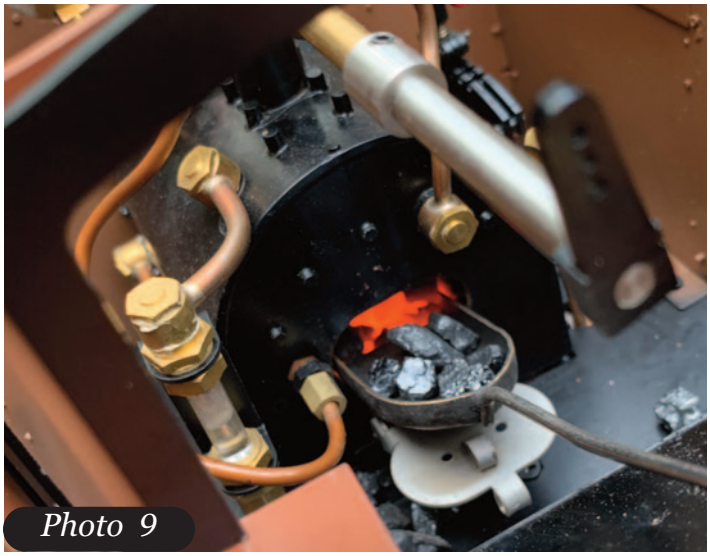


Photo 9

tions and shipped the entire lot back to China for alterations. The result is a highly functional and easy to use locomotive that is a pleasure to run. As a negative balance to these improvements, I would very much like to see Accucraft move away from the roof which is hinged off to the side, in favor of a hinge which pivots at the front. **Photo 7** shows the layout of the cab with the tender cover on, while **Photo 8** shows the tender cover off, exposing the tender pump.

## Operation

Ok, enough with the background stuff. Time to have some fun. And you can forget the beer. Running a coal engine takes practice and focus. Following normal practice, I lubricated all moving parts of the mechanism and made sure that all the valves were closed.

As opposed to other engines with equivalent-sized fireboxes I made the assumption that I could burn normal grain-sized coal. (Grains range from 1/4 to 3/8th-inch in all dimensions. Bean sizing, the other common Welsh coal size, is approx 1/2 to 3/4 inch in all dimensions.) I filled the boiler up with water to about two-thirds showing in the water glass. After opening the bypass valve located on the side under the engineer's side of the cab and priming the water line with the tender pump, I loaded the firebox with charcoal completely up to the bottom of the firebox door. My method for prepping the charcoal is to soak it in kerosene and keep it in an airtight container such as a Ball canning jar – this has always worked well for me.

Now place the blower fan on the top of the stack and light the charcoal. It took about 10 minutes before the pin was off the zero mark and I could turn on the blower. Every engine will act a bit different when bringing up to pressure. Don't be impatient by trying to use the blower too early as I did. (I did have to add more charcoal a few minutes later to assist things.) As I added the coal the pressure came up quickly (**Photo 9**). The safety released very nicely at about 70psi.

I didn't bother with the cylinder cocks, preferring instead to give a little 0-5-0 assist to get the engine moving. Once the cylinders cleared, the engine trundled off quite nicely and controllably. This one has a very nice and audible chuff to the motion. I had to add coal only sparingly – the boiler seemed to be an efficient user of fuel. And one of the benchmarks of good coal-fired locomotive design - the engine did not require the use of the blower to maintain pressure during the run.

I had a successful run of about an hour and 15 minutes with no loss of fire. The axle pump ap-


Photo 10

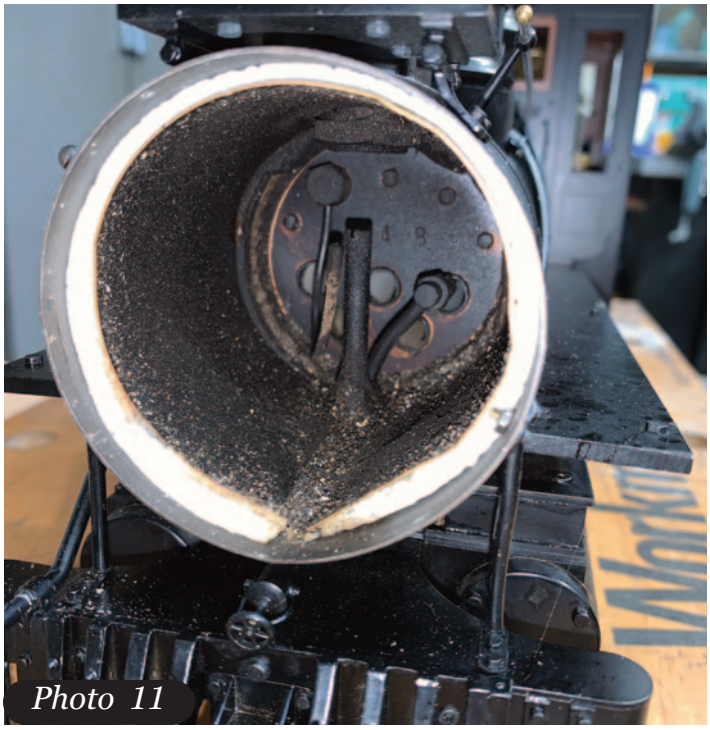


Photo 11

peared to work nicely and was able to "make up" the water in the boiler rather than just "keep up" – good insurance against having to stop and pump water in using the tender pump. One thing I did notice is that, because of the loco's high center of gravity, the track it runs on should be relatively free from outside camber around curves. A turnover didn't happen to me but I did notice the engine leaning a bit too much for comfort at times. (Yeah, track improvements are scheduled.)

After the loco cooled down it was time to clean out the ashes and coal remains. The good news is that, with practice and perseverance, both the ashpan and grate can be removed without turning the engine on its side, although you do have to support the back of the engine off the end of a table to do this. After cleaning both can be reattached with the engine upright. See **Photo 10**.

Likewise, the smokebox needed to be checked and cleaned. I took out the two M2 screws on either side of the smokebox front, and removed the entire front of the smokebox to look at things. See **Photo 11**. The smokebox front was a very tight fit. I would think that the fit itself would eliminate the need to secure it with the screws — your choice.

## Summary

All in all, this locomotive is well designed, well detailed and a joy to run. It was a very satisfying experience. Again, kudos to Accucraft for listening to suggestions and following through with the improvements to make the engine really ergonomically useable. This locomotive will make a nice addition to your coal-fired arsenal – I highly recommend it.

**Specifications**

| | |
|---|---|
| Scale: | 7/8ths Scale |
| Gauge: | 45mm |
| Minimum Radius: | 6 1/2 feet |
| Length: | 22.1 in. (562 mm) |
| Width: | 6.1 in. (155 mm) |
| Height: | 8.7 in. (221 mm) |
| Fuel: | Coal |

Features

Safety valve,
Full working Stephenson valve gear
Forward/Reverse Johnson bar
Lubricator
Pressure gauge
Water level gauge
70 PSI working pressure
Coal grate
Axle water pump
Large firebox door
Coal shovel, pick and flue brush included



# THE TRAIN DEPARTMENT

www.thetraindepartment.com

*REGNER* - ROUNDHOUSE - BOWANDE

Hazlet, NJ USA
732-770-9625
thetraindepartment@gmail.com

ROUNDHOUSE
Davenport 1/19

Sept/Oct delivery

*REGNER*
Heisler kit and RTR in stock

Accucraft replacement backhead checkvalve for handpump add-on

## Rishra - Industrial 0-4-0
available in 32 or 45mm gauge

$1575.00 USD
Late 2020 production slots
QR code link to video of Rishra running

1/19 Scale 32 or 45mm
Butane poker burner
Sightglass and goodall
Slide valve cylinders
Slip eccentric
TTD gas and steam valves
Weebee Safety
35min + runtime
Brass detail castings
Lined in Blue, Green, Red or Black

## Talyllyn No1 in 1/19
available in 32 or 45mm gauge

$2100.00 USD

Specifications

| | |
|---|---|
| 1/19 Scale 32/45mm Gauge | Fully bushed chassis and rods |
| Min radius 2'6" | TTD fine gas and steam valves |
| Slide valve cylinders | Full Warranty worldwide |
| Stephenson valve gear | US/AU/UK service points |
| Ceramic butane burner | Spares and repair parts stocked |
| 6mm Sightglass | Green, Red and Black lined |
| Goodall Valve | |

We also stock live steam supplies, steam and lubricating oil, pressure gauges, sight glass, valves and fittings along with nut/cones, miniature quick disconnects, ceramic insulation, Hitec Radio Control.

***See website for preowned listing***

*Worldwide Shipping USPS*

# Building the Blue Comet Part Six

*Rick Parker Photo*

Text & Construction Photos by Bill Allen

## Cab & Tender

The cab on the Blue Comet is fairly simple except for the lower front, which is set back, and angled back again. This shape is copied from the drawing and the side pieces are cut out and rivet embossed. The roof is also rivet embossed before bending. The embossed rivets stop just short of the three hatch covers which are bent to the roof curvature (**Photo 6-1**) The window opening as well as the window frame are cut our on the mill using the digital read out (DRO). The window glazing is 1/16th-inch polycarbonate (**Photo 6-2**). **Photo 6-3** shows the cab rivet detail
Unfortunately, I didn't get any good photos of the cab build but the technique is the same as other builds in prior publications.

### Tender Trucks

The trucks were new to me and appeared to consist of a long cast side frame with axle box inserts. As I would have to make eight side frames for the two tenders, Dennis Mead and I decided to cast them in resin and back them up with CNC cut steel pieces. From a photo of the truck, Dennis drew up the frame in CAD. Then from Shapeways we ordered one frame in their high resolution plastic and axle boxes in their regular plastic. Then using the Shapeways frame as a master, I made a silicone mold and cast them in resin.

*Photo 6-1*

**Photo 6-4** shows from top to bottom, the Shapeways master, the Shapeways axle boxes, the resin frame with the axleboxes glued in place, and finally the painted frames. The Shapeways axle boxes didn't take the paint very well so I had to prime them with Rust-Oleum 2X primer which is plastic compatible.

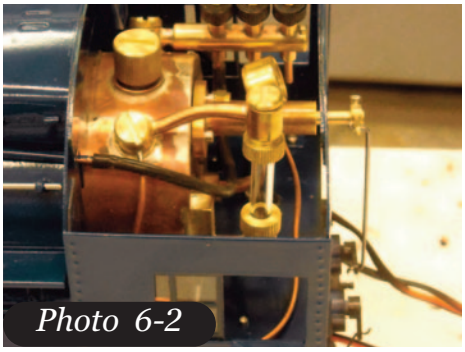


Photo 6-2

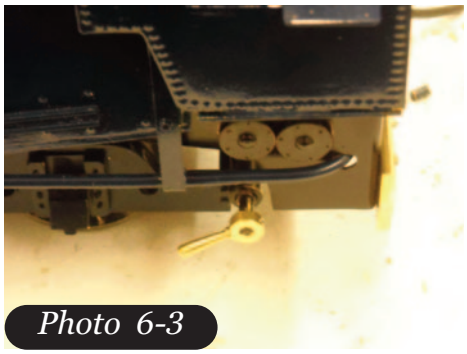


Photo 6-3

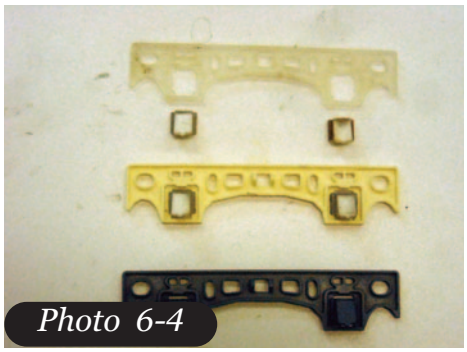


Photo 6-4

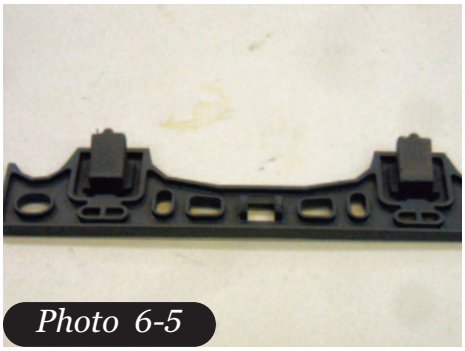


Photo 6-5

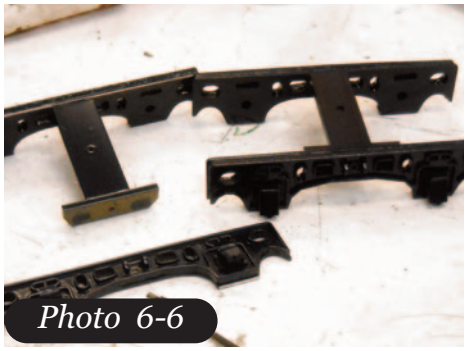


Photo 6-6


Photo 6-7


Photo 6-8

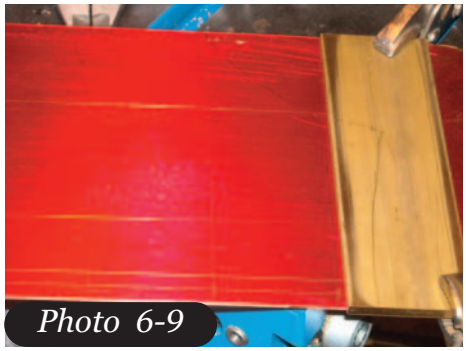


Photo 6-9

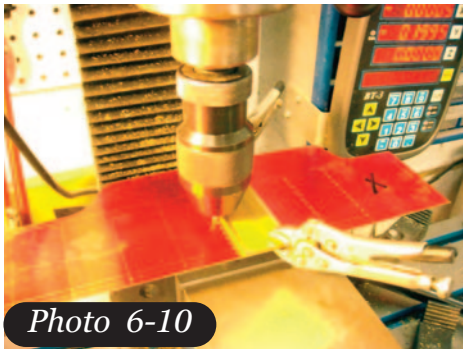


Photo 6-10

**Photo 6-5** shows the nice detail of the casting. The actual truck was made of steel and brass. Before the cast pieces were attached with JB Weld, the steel frame backers were silver soldered to the cross brace on one side. On the other side, a flat piece of brass was soldered on. This is shown on the left side of **Photo 6-6**. On the right side the assembled truck is shown. The reason for this construction is twofold. It makes for easy removal of the wheel sets and it allows the one side to rock independently of the other ensuring that all four wheels are always in contact with the track. **Photo 6-7** shows a close-up of the 4-40 socket head screw that is set with loctite and acts as a pivot. You can see the flat plate behind the frame which keeps that frame true to the opposite side.

**Photo 6-8** shows the finished truck with the wheels installed.

## Tender

The tender has several rows of vertical rivets on the sides which needed to be embossed prior to bending. I sprayed the entire sides with red layout dye and then using a square, I scribed the lines for the rivets. I cut a piece of flat brass to use for a guide. It needs to be wide enough to keep the small vice grips from interfering with the embossing operation (**Photo 6-9**).

I then clamped my female embossing tool in the mill vise, chucked up the male tool and started embossing (**Photo 6-10**). You can't see it but the female tool has two holes, one for riveting and the other to receive the embossed rivet, thus spacing each rivet.

After the rivet embossing, the ends of the sides were bent in to form the front and back corners. The floor was cut to the fit the two sides and the

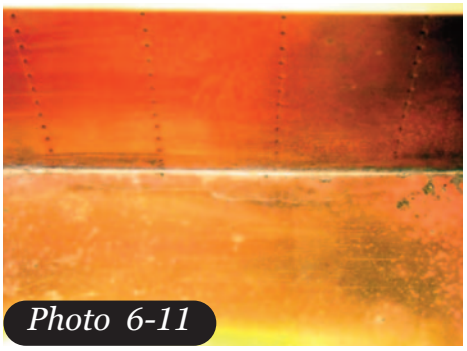


Photo 6-11


Photo 6-12

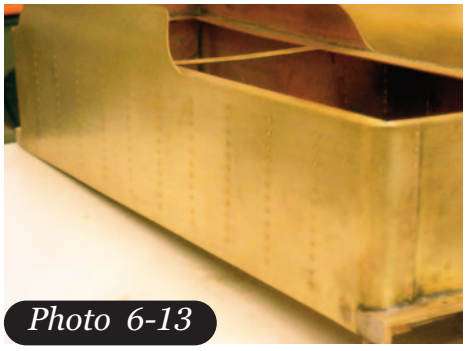


Photo 6-13

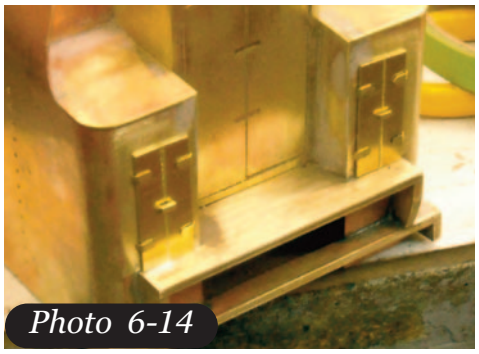


Photo 6-14

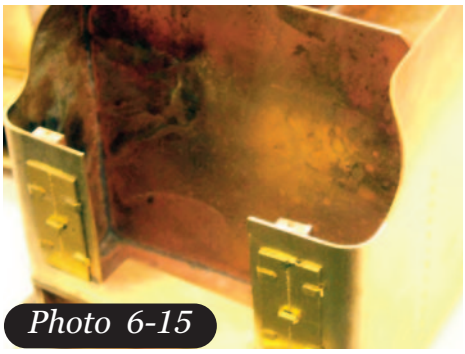


Photo 6-15

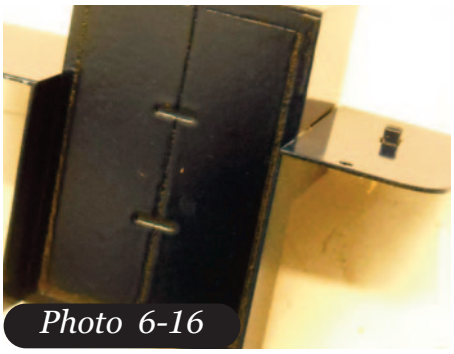


Photo 6-16

tender shell is soldered together. This needs to be done right as it needs to be water tight. I use Staybrite as it is the only soft solder that flows right for me. The hard part about soldering a large structure of sheet brass like this is that if you don't get it hot enough, the solder won't flow and if you get it just a little to hot the sheet will bend and buckle making a water tight seam impossible. I use the 1/32" staybrite and their flux. I lay strips of solder along the seams and then with a Burnzomatic type propane torch, I gently heat the assembly from the outside and then turn the torch right on the solder lying in the seam. As soon as it starts to melt, I start moving the torch along the seam. If the solder starts to melt but not flow into the seam, the assembly isn't hot enough. If the solder is melting ahead of your flame, you are moving it too slow. It takes a little practice but seams like in **photo 6-11** are what you want.

The top which is several strips of the sheeting is a little trickier as the strips tend to buckle even more than the big sheets. (**photo 6-12**)

**Photo 6-13** shows the rear of the tender with the side panels soldered to the rear section and the rear deck fitted to and soldered on to the rounded rear corner.

The front of the tender is the most challenging with its protrusions and doors. The two tenders are a little different from each other as one engine is equipped with remote control (RC) and the other isn't. The front of the non-RC tender has several pieces soldered together to replicate the prototype (**Photo 6-14**). The RC Version will store the batteries, receiver and on-off switch. **Photo 6-15** shows the side panels bent around with the faux access doors soldered on. Also note the two tabs at the top which will secure the inset piece in **Photo 6-16**. This unit slides in and covers all of the electrical equipment. It is held in place with two 0-80 socket head screws which go through the two holes in the font of the side plates. Also mounted on the side plate is the power switch. (You can skip ahead to **Photo 6-28** if you want to see it installed.)

The tender of the Blue Comet had a water scoop which would be lowered when passing over sections of track that had a water trough, thus filling the tender without stopping. From the scoop, a pipe went up above the top of the tender and bent down to fill up the tank. This gooseneck was covered with sheet stock. **Photo 6-17** shows the deck with the wide water hatch in the rear section and the goose neck in the middle section. A power cylinder to raise and lower the scoop goes in the front section. I will use that unit for my fuel valve knob, but it or the hole it goes through isn't shown.

**Photo 6-18** shows the two rear ladders. Con-


Photo 6-17

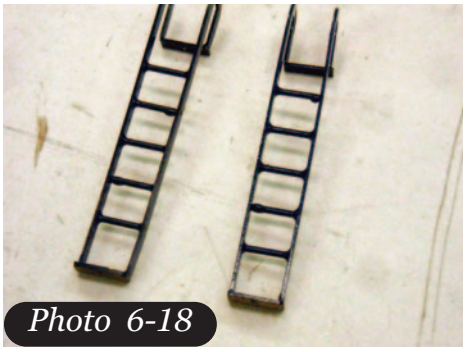


Photo 6-18


Photo 6-19

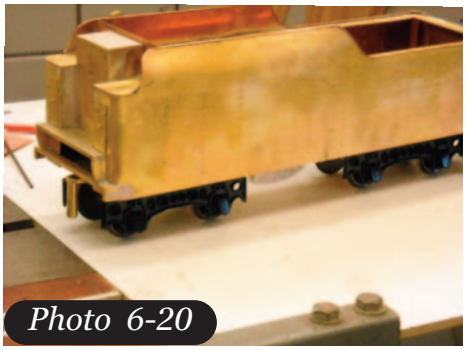


Photo 6-20


Photo 6-21

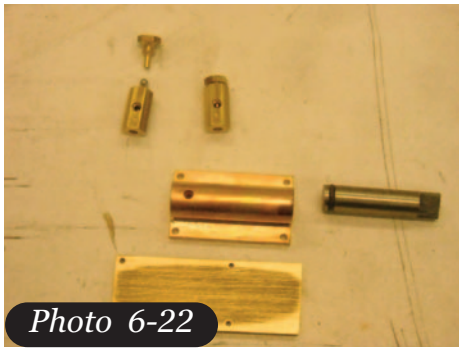


Photo 6-22

struction is similar to my previous builds.

The top of the tender sides needs to have beading on it. I use cut 1/16th-inch copper tubing for this. First off, I would not recommend anyone without a thorough knowledge of table saw operation trying this. With this caution in mind, what I do is replace the stock throat with a zero clearance throat and clamp a straight board on the fence which has zero clearance with the table bed. This prevents the narrow piece of tubing from being drawn into the throat or under the fence. I set the fence at about 0.040-inch, which will then cut about 0.022-inch from the tube and expose the hollow center. The tube needs to be 36 inches long. In **Photo 6-19** you can see my finger very close to the blade but my left hand never moves from this position. The right hand, which is from 18 to 30 inches away, does the feeding. Thus the need for a 36-inch length. I slit the tube till it is halfway through and then turn it around and do the other end. The inside diameter of the tube is 0.032-inch, and as I didn't cut half of it off, the opening is a little less than 0.032-inch, which is the thickness of my sides. I usually slide a standard scraper down the slit to open it up a little and then force a piece of the 0.032-inch material down the slit. This opens it up and it is now a push fit onto the material. I then anneal it so that it will bend around the curves and push it over the top of the sides. Usually it will stay put even around the curves because of the tight fit but I then remove it and glue it on with either JB Weld or canopy glue. I hold it in place with masking tape while drying, just to make sure it doesn't move. **Photo 6-20** shows the beading on the tender, and **Photo 6-21** shows a close-up after painting. Also shown in that photo are the small rivets along the top of the tender. Micro Mark sells some rivet decals which only go up to O scale and are too small for most of our jobs, but in this case, the smaller rivets used in this location on the tender worked out perfectly.

The hand pump parts are shown in **Photo 6-22**. Since the hand pump gets some rigorous action, bolting it onto a sheet-metal water-tight bottom doesn't make sense. I made a 1/8th-inch thick base with four 2-56 tapped holes which was soldered to the tender floor. This is shown at the bottom of the photo. Above that is the pump body and ram followed by the two check valves. The intake and outlet valves are the same but the inlet valve mounts through the side hole and the outlet mounts to the pump through the bottom hole as shown in **Photos 6-23** and **6-24**.

**Photo 6-25** shows the pump mounted in place with the outlet and the fuel tank outlet pipes attached to brass fittings in the floor. Also you can

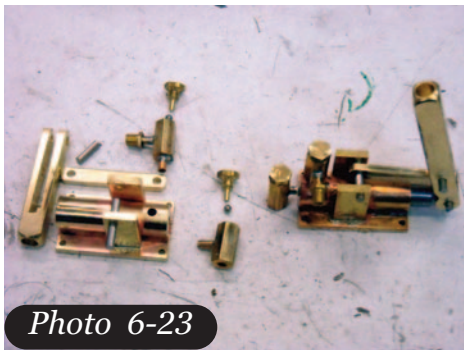


Photo 6-23

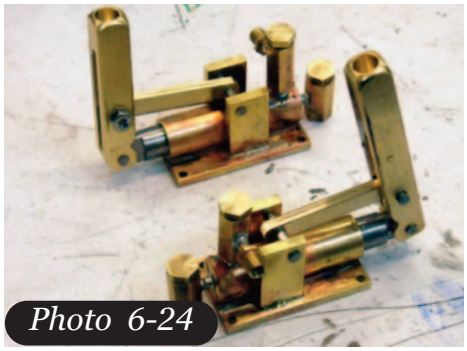


Photo 6-24

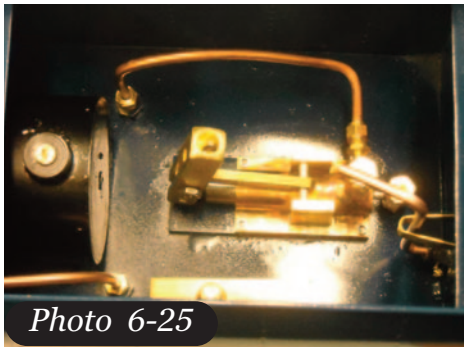


Photo 6-25

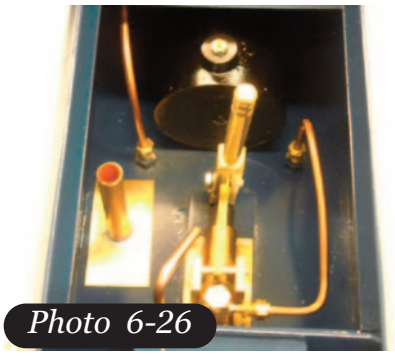


Photo 6-26


Photo 6-27

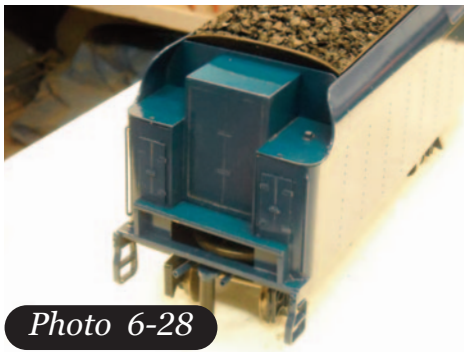


Photo 6-28

see the bypass tube in the front coming through the bulkhead.

**Photos 6-26** and **6-27** show the pump handle in use in the pump and stored in the handle holder.

Finally photos of the front and back of the tender with the coal load and gas valve knob in place (**Photos 6-28** and **6-29**)

In the photo below, you can see the completed tender with the water scoop underneath it and the CNJ Herald which was researched and designed by David Fletcher. Decals were by Stan Cederleaf. Etchings by Narrow Planet

So that completes this series. I tried to explain a little more of the theory behind my building techniques than in previous articles. I hope you enjoyed reading this as much as I did building these engines.

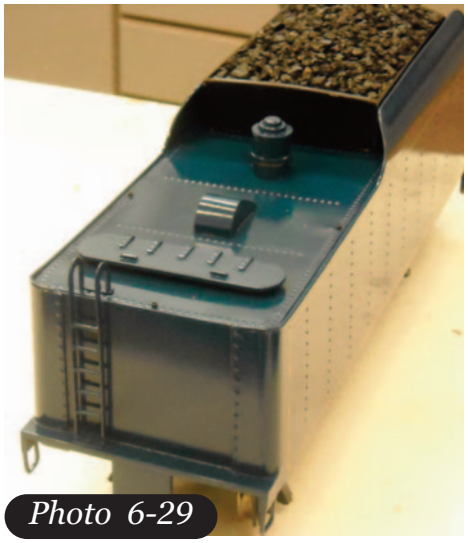
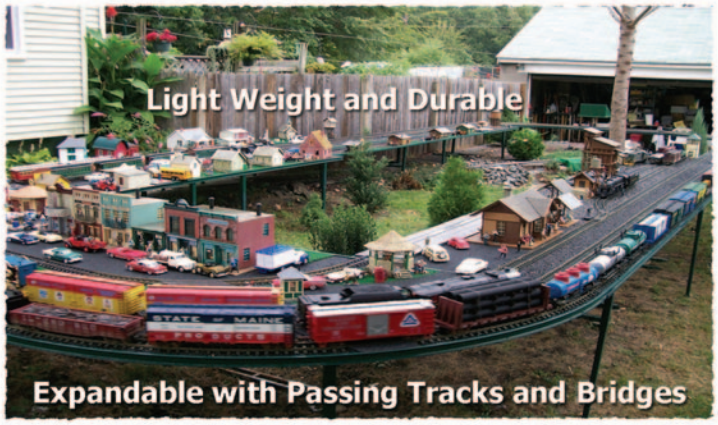


Photo 6-29

# EAGLEWINGS IRON CRAFT

www.eaglewingsironcraft.com
**Phone: (602) 276-8101**

*"Let Eaglewings help you design your layout today."*


## Indoor and Outdoor Portable Layouts

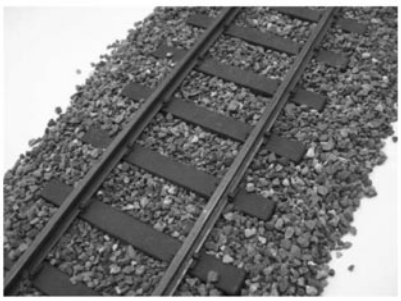
*Eaglewings' all weather solid steel layouts are easy to move and setup. They can be customized to your configuration and are built to last.*

*Check Our Web Site For Open House Events in December and April*

# *Sunset Valley Railroad*

## *The world's most comprehensive code 250 track system*

We offer 45mm, 32mm and dual gauge track in both narrow gauge and mainline scales. We offer 4 kinds of rail, aircraft alloy aluminum, brass, nickel silver and stainless steel. We have a full range of switches and pneumatic switch operators to complement our track. It's a winning combination of price and quality!

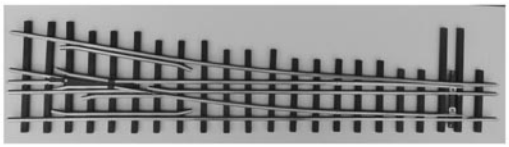


Our narrow gauge track is prototypically correct, with scale 6ft long by 8 inch wide ties at 2ft spacing, with 75 lb rail – just like the real railroads. Why put down toy track when you can get model track made to the correct dimensions?

### Accucraft/Aster Roundhouse

Sunset Valley is a preferred dealer for Accucraft/Aster and Roundhouse Having built over 50 Aster engines in the past we are able to give expert technical advice and help when you build your kit

Roundhouse Davenport



We make 38 types of switch in brass, stainless and Ni-Sil for every track requirement. Sizes #3, #4, #6, #8 and #10, plus curved and crossings.

**Email pete@sunsetvalleyrailroad.com**
**Call 253-862-6748**
**Check our website for color photos and movies**

**We carry about 19,000ft of track and 400 switches in stock so we can ship your order immediately. Why wait for some vague promise of future delivery?**

**Nearly everything proudly made in the USA !**

**sunsetvalleyrailroad.com**

Workshop Project

# The Minitram Part Two

Design, Text, and Photos
by Marc Horovitz

We'll start this section by making some **wheels**. These can be more or less any size, within reason—there is some latitude. However, they should be no smaller than one inch or so, measured across the tread. Otherwise the gear may foul your switches. The wheels shown in the drawing are the size I used on my tram. If you prefer, you can use commercial wheels, but you'll have to adapt them to one-eighth inch axles.

Chuck up a piece of 1-1/4-inch brass or steel bar. I prefer steel for wheels but had brass on hand, so that's what I used. In reality, it works just as well for an engine of this size. The chuck on my lathe is too small to carry a long bar that big, so I had to cut off a chunk that could be held comfortably. This gave me enough to rough cut only two wheels without overhanging too far. **Photo 55** shows the setup.

Face off the end of the bar. Then turn the bar to the maximum size of the wheel, over the flange. We'll be working on the backs of the wheels. Start cutting away the back, down to the hub size. When the hub is fully formed as per the drawing in Part One (*Steam in the Garden, November/December 2020, No. 170*) (**Photo 56**), part off the wheel. Repeat three more times (**Photo 57**), making sure that the hubs are all the same size.

Take one of the wheel blanks and hold it securely by the hub in the three-jaw. Center drill, drill #32, then ream the axle hole one-eighth inch. Cut in the tread of the wheel, leaving a square flange, 1/16th-inch high (**Photo 58**). Chamfer the edge of the wheel tread. The face of the wheel can be recessed as per the drawing to your own liking, or not at all—it's your choice. I think that recessing it adds a little bit of character and it's quick and easy to do with a round-nose tool (**Photo 59**).

With a flat file, gently round over the flange on the tread side to about half its thickness (**Photo 60**). Now reverse the wheel in the chuck and round over the other side of the flange until it meets the first side at a point in the center (**Photo 61**). Repeat three more times.

When you've done all the wheels it is time to drill the hole in the hub for the set screw. Since there are four wheels, it will be more expeditious to make a drilling guide, which you can also use for other similar jobs. This can be made from a piece of five-eighth inch diameter round stock. Chuck it up in the lathe and drill a hole in it that comfortably fits the hub of the wheel. Then part it off one-quarter inch thick (**Photo 62**). Grip this ring in your drill-press vise by the flat faces and carefully measure the center point of the ring's edge (**Photo 63**). Then center punch it and drill #43. Clean up the burrs and you're finished (**Photo 64**).

Slip the guide onto the hub of a wheel and grip the wheel by the flat faces in your vise. You can protect the wheel's finish with some paper. Don't grip the guide—it needs to be free to rotate (**Photo 65**). Move the guide so that the hole is at the top, then bring the drill down into the hole. Adjust the guide until the drill moves freely, then, holding the guide onto the wheel with your thumb, drill the hole (**Photo 66**). Remove the guide and tap the hole 4-40. Clean up the burrs, insert a 4-40 set screw, and you've got a finished wheel. Now do it again three more times (**Photo 67**).

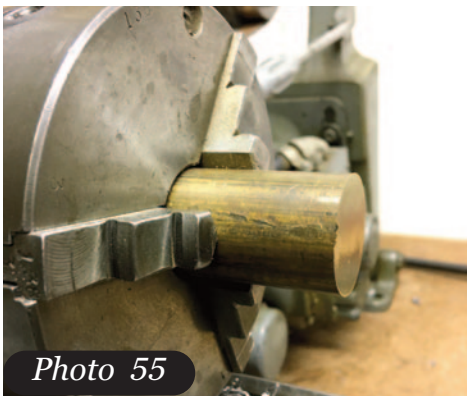


Photo 55

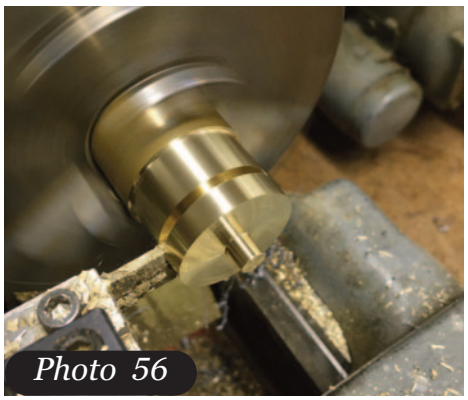


Photo 56


Photo 57


Photo 58

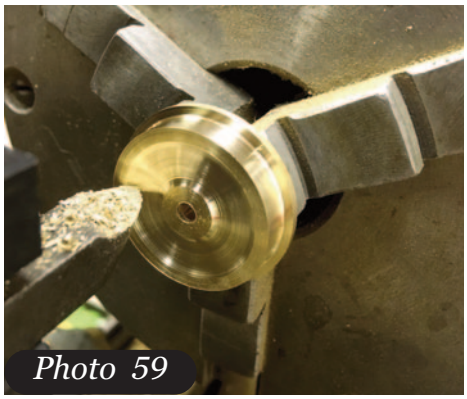


Photo 59

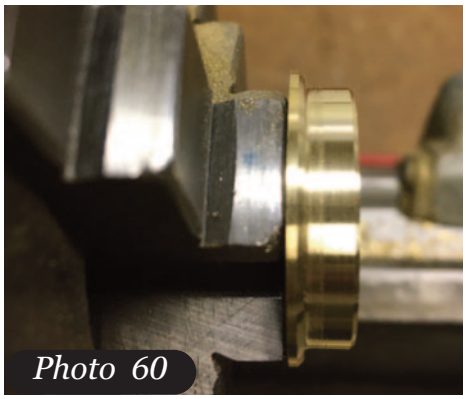


Photo 60

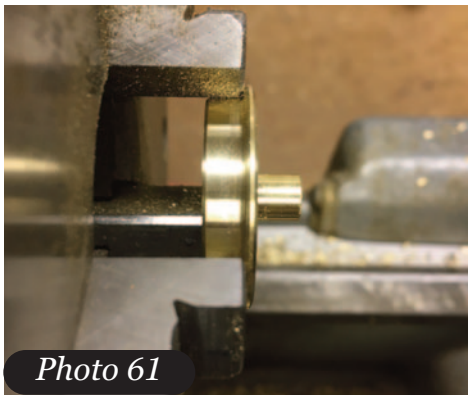


Photo 61


Photo 62

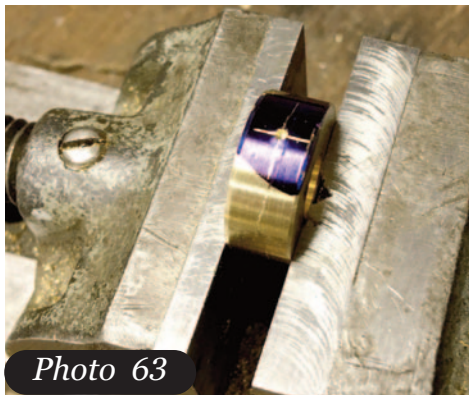


Photo 63

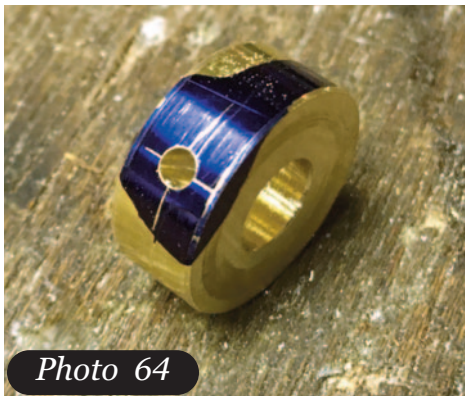


Photo 64

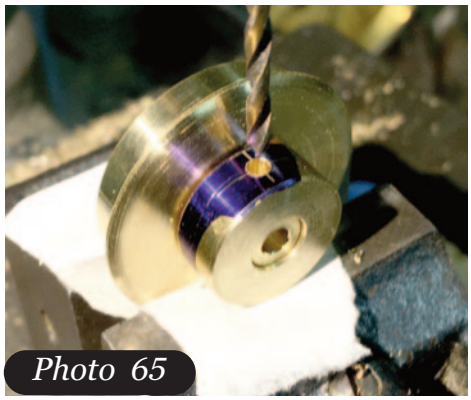


Photo 65

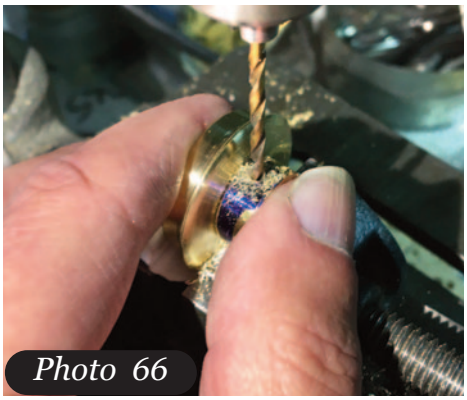


Photo 66

## The frame

The **frame** is made from one-inch x 1/16th-inch flat bar stock, either steel or brass. If you don't have metal this size, you can cut it out of flat sheet, as I did. Cut the two end pieces 3.250-inch long, and the two side pieces 5.000-inch long (**Photo 68**). Make sure the ends of the pieces are nicely squared up, then set them aside.

Cut the four **corner posts** from quarter-inch square bar. I find it easiest to cut these accurately in the lathe. To hold square stock in a three-jaw chuck for this kind of operation, I use a split-ring collet. These are easy to make. The diagonal dimension of a quarter-inch square is about 0.353-inch. The closest drill to that size is 9mm (0.354-inch) or a letter T drill 0.358-inch. Either will


Photo 67

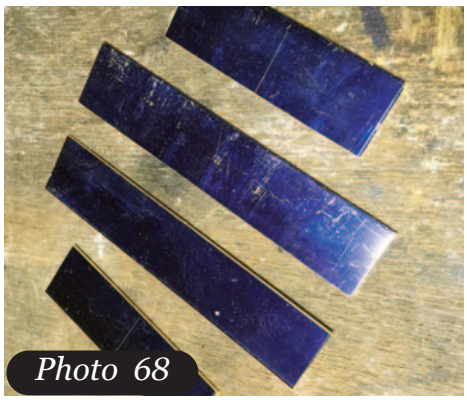


Photo 68


Photo 69

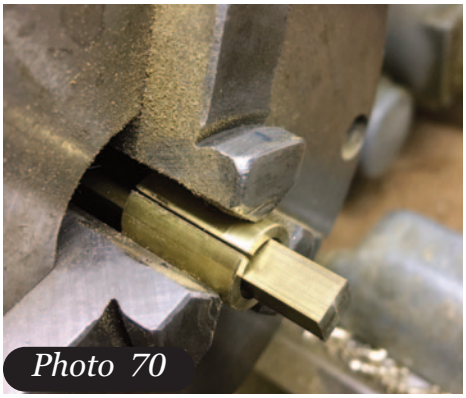


Photo 70

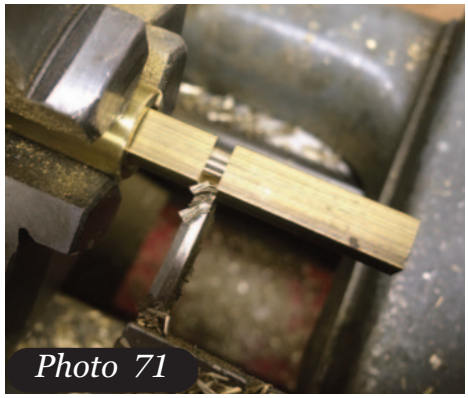


Photo 71

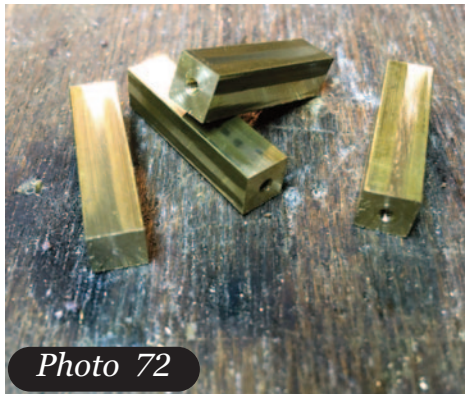


Photo 72

do. Cut a piece of half-inch round bar, three-quarter inch long, and chuck it up in the lathe. Center drill it and drill through with one of the above bits. Then put it in your vise and, using a hacksaw, split it the long way. That's all there is to it (**Photo 69**).

Slide your quarter-inch square bar into the collet and put it in the chuck, with about 1-1/4-inch sticking out. The split should be in the middle of one of the flat sides of the bar and centered between two jaws of the chuck. When you tighten the chuck, the split ring will clamp the bar in place (**Photo 70**). Center drill the end and drill #50 x 0.25-inch deep. Tap the hole 2-56. Then part off the piece 1.000-inch long (**Photo 71**). Do this three more times (**Photo 72**).

Then, as per the drawing, carefully lay out the holes on two sides (**Photo 73**). Center punch and drill the holes #50, then tap them all 2-56. Do this with all four pieces (**Photo 74**).

A word about tapping. As you know, the tap must go straight into the drilled hole. Any angularity will probably cause binding at best and a broken tap at worst. I do most of my tapping in either the lathe (when I can) or in my drill press. In the drill press, I hold the tap in a small chuck that is mounted to a one-half inch diameter arbor. This arbor is held in the larger chuck of the drill press. The setup is shown in **Photo 75**. After drilling the hole, and without removing the work from the vise, I replace the drill with the tap, then loosen the larger chuck slightly so that the smaller chuck's arbor is free to rotate in it. Then I can turn the smaller chuck by hand, knowing the tap will be entering straight.

Now that the corner posts are done, we can return to the frame. Carefully mark, center punch, and drill the end beams as per the drawings (**Photo 76**). They must be done separately, as they have different holes. Also note that I have not specified a coupler, as everyone has their favorite. I did specify a 2-56 hole in the center of each end beam for a coupler mount. Feel free to disregard or change this to suit your own needs.

The side frames are best drilled together. The trick is to hold them absolutely together so that they don't move at all, relative to one another, during the whole process. Some people like to solder them together, then separate them later. I've tried this and it works well under most conditions. However, this time I think it's best to screw the frames together.

Carefully mark out and center punch all of the holes on one side frame. Then mark out one each of the far left and far right holes on the other side frame. It doesn't matter which ones. Drill those two chosen holes #43 on the frame that is fully marked out and punched. On the other frame, drill the two holes #50 and tap them 2-56. Clean off the burrs, then screw the two frames together with one-eighth inch long 2-56 screws. Make sure that the edges of both frames are all flush with one another. If the screws stick out the back at all, file them flush with the frame so that it will lay flat on the bench. Once that's done you can treat the assembly as a solid unit and go ahead and drill all of the remaining holes as specified. When that's done, unscrew the

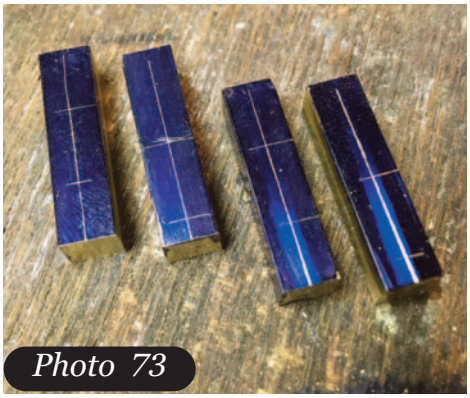


Photo 73

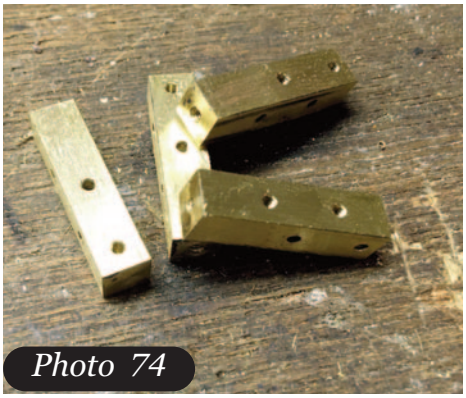


Photo 74

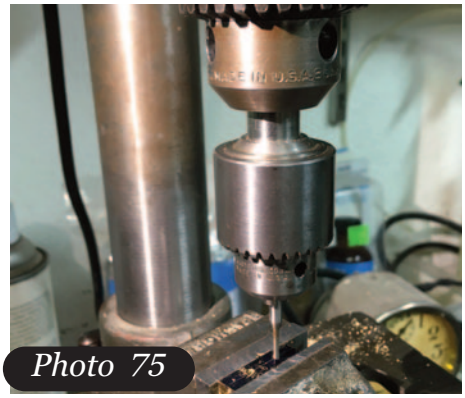


Photo 75

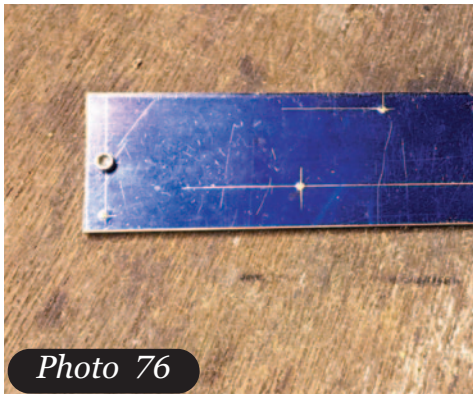


Photo 76

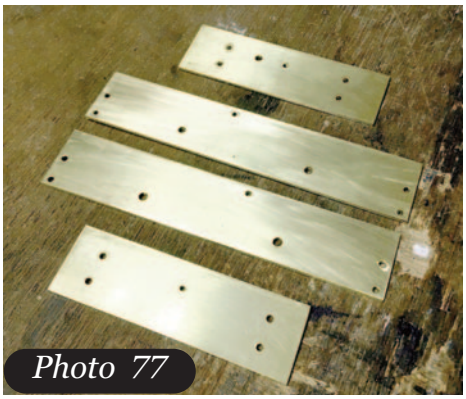


Photo 77

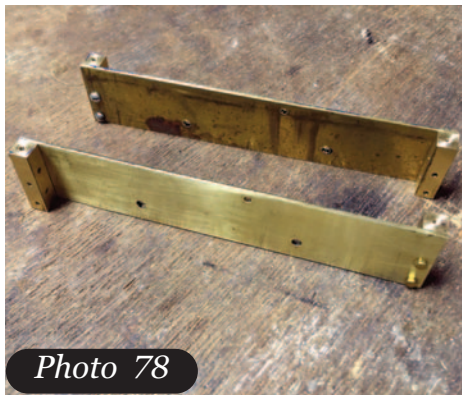


Photo 78

frames and drill out the tapped holes on the bottom frame with a #43 drill. All of the finished frame pieces can be seen in **Photo 77**.

Now the frame can be assembled. You can use any type of screw that appeals to you—round head, hex head, pan head, binder head, socket head, cheese head, etcetera. I like hex heads because I think they look more railroady. First, screw the corner posts to the side frames. The posts go outside the frames at the rear end and inside at the front (**Photo 78**). Now, on a flat surface (plate glass, for instance) start screwing on the end beams. Screw one end beam on first, then the other. The frame must be square and it must sit dead flat. Otherwise, you'll only have three wheels on the rails at any given moment. If any of your holes have been misdrilled, now is when they will show up. If you find that to be the case, determine the offender and open the hole a little with the next size drill. If the error isn't too bad, that should be enough to correct the fault. The assembled frame is shown in **Photo 79**.

Cut the **axles** to length from a piece of one-eighth inch drill rod. They should be close to the specified dimension. They could be a tad longer but they do need to be the same length. I like to cut them slightly oversize with the hacksaw, then true them up on the belt sander. Put a little chamfer on the ends to remove the burrs. Then set them aside.

Cut the **cross brace** and the **motor mount** from quarter-inch square stock. You might mark which is which, as they are the same length (**Photo 80**). Before cutting the cross brace, measure the space between the side frames at the attachment hole for the cross brace. That measurement should be very close to that specified on the drawing for the length of the cross brace. If it is far off, measure the space between the frames at either end. Again, they should be close to that specified for the cross brace, as well as being close (or the same) as each other. If those dimensions check out OK but the middle one does not, that means your frames are bowed. Straighten them out.

Drill both ends of the cross brace #43 x 0.375-inch deep and tap 4-40. Drill the #33 hole as specified and counterbore it to clear the head of the screw you're going to use (**Photo 81**).

Drill one end of the motor mount as above, and drill and tap the cross hole at the other end as per the drawing. Mark, center punch, and drill the holes for the motor (**Photo 82**).

Install the cross brace with a pair of 4-40 screws through the side frames. If you are facing the front of the engine, the cross hole should be toward the left (**Photo 83**). Screw the motor assembly to the motor mount as per **Photo 84**. Now screw the whole assembly to the chassis, one end to the front beam and the other to the cross brace (**Photo 85**). Slip an axle through one of the axle holes near the motor and slide on the remaining 43T gear. Leave the gear loose and slide the axle through the other axle hole.

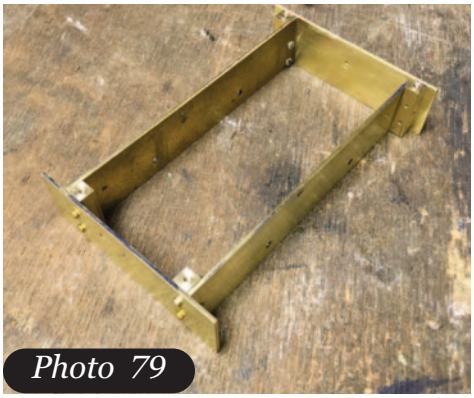


Photo 79

Photo 80


Photo 81


Photo 82

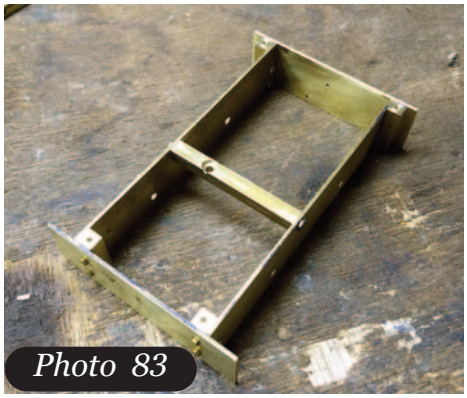


Photo 83


Photo 84

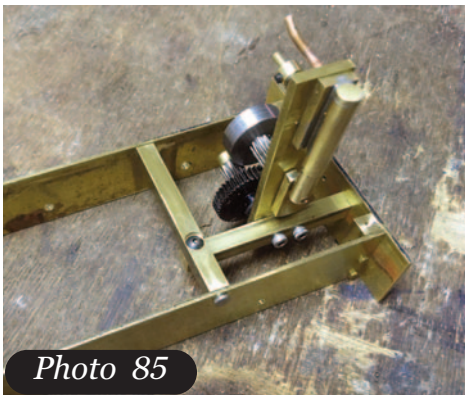


Photo 85

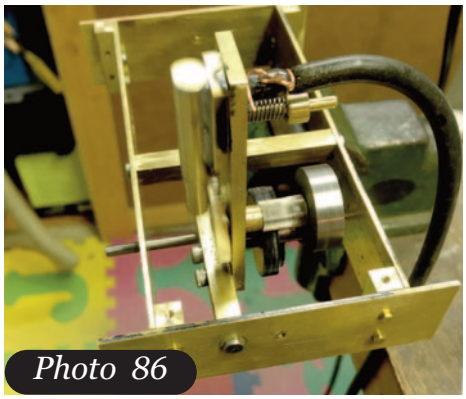


Photo 86

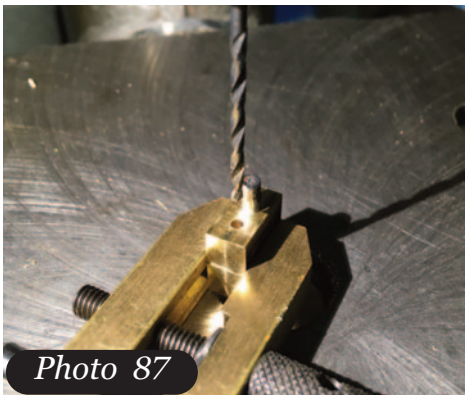


Photo 87

Moment of truth time. The 8T gear on the motor assembly should neatly engage the 43T gear on the axle. There should be the tiniest amount of slop—what is called backlash. If the mesh is tight, that's not good and must be resolved before proceeding. There are a couple of options. The motor-mount holes in the motor-mount bar could be enlarged slightly and the motor slid toward the front of the locomotive just a little. The screws holding it in place must be very tight to prevent further movement. Another option, perhaps a better one (I had to do this) is to remake the motor mount, increasing the distance between the end of the mount and the motor-mount holes by 0.010-0.015 inch.

Once you get things where they seem to be smooth, grip the frame in a vise and hook the motor up to your air source. Start at 20 psi. The motor should run very fast and smooth. If there is any intermittent hesitation, the source must be found and relieved. Once the whole assembly is running quite smoothly, reduce the pressure to 10 psi. If everything is still running smoothly (it should be), continue to slowly reduce the pressure. My engine runs happily on 5 psi or less (**Photo 86**). When you get yours to that point, run it for 15-20 minutes on the lowest pressure that will keep it going. This will begin to wear it in and improve its performance once it's on the track. It's worth spending the time and energy here to get everything as it should be. It will save a lot of tears later. Make sure everything is well oiled.

All that's left in this section are the **wheel cranks** and the side rods. The wheel cranks are made from quarter-inch square stock. Chuck up a piece, using the split-ring collet, and cut off four pieces, each 0.475-inch long. Carefully lay out, mark, center punch, and drill the two holes in one of the cranks. In the other three, drill only the one-eighth inch hole. To make sure the holes are equidistant in all of the cranks, use the first-drilled crank as a jig. Slip a piece of one-eighth inch rod into a partially drilled crank, sticking out at the top. Then slide


Photo 88

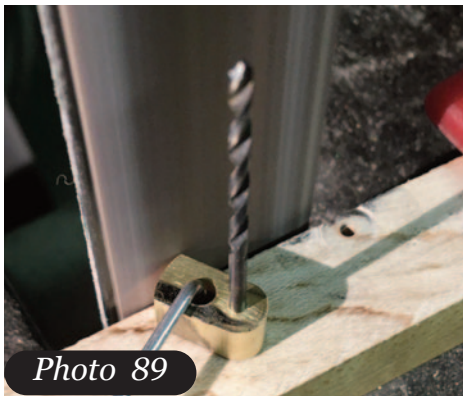


Photo 89


Photo 90


Photo 91


Photo 92

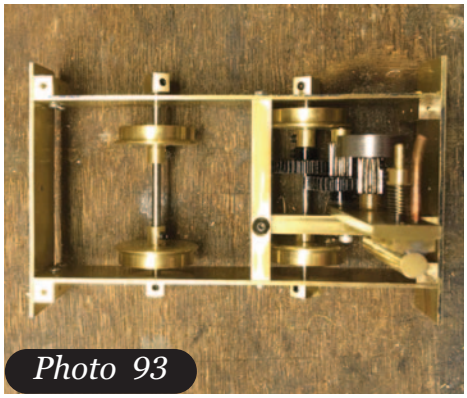


Photo 93

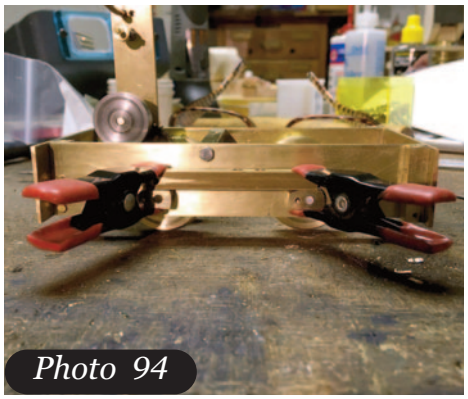


Photo 94

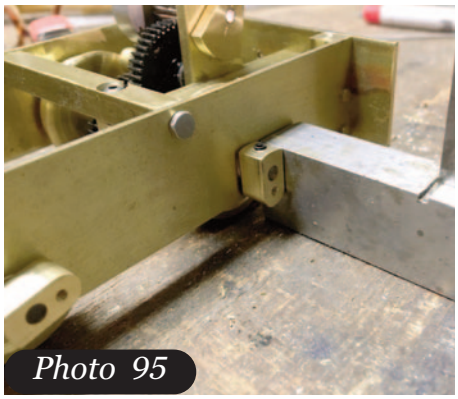


Photo 95

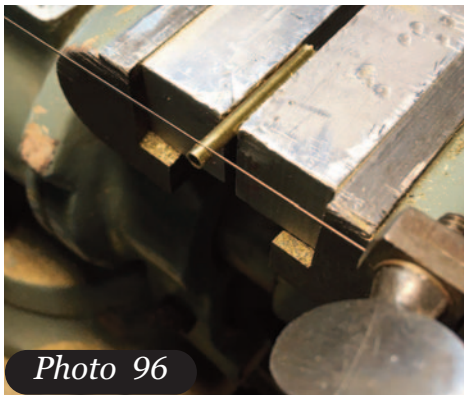


Photo 96

the fully drilled crank on top if it and hold them both in your drill-press vise or a hand vise (**Photo 87**). Drill through the #50 hole in the first crank, into the second. Do that for the remaining two, and all of the cranks should be drilled equally. Don't tap the 2-56 holes yet unless you don't want rounded ends.

If you do want round ends, you can round them quickly and easily with a belt sander by making a little jig. This is nothing more than a piece of hardwood, like maple, with a #50 hole drilled in it less than 0.125-inch from one edge. This should be clamped to the sander's table with one clamp, being free to pivot a little at the point of clamping. Put the back end of the drill into the hole and slip a wheel crank over it. Using a rod in the other hole to manipulate the crank, slowly move the wooden jig toward the belt, rotating the piece into the belt as you go. **Photo 88** should make the process clear. Incrementally move the jig until it is close enough to the belt to round over the entire end. You could use the same jig, with a new hole moved inward from the edge of the wood somewhat, to round off the other end. Use the same radius point and drill bit, as that end is not as rounded (**Photo 89**).

Once the ends are as you like them, tap the 2-56 holes. Then return each crank to the split-ring collet in the lathe, with the large hole foremost, and center drill and drill #43 to the cross hole, then tap the end hole 4-40. **Photo 90** shows the finished wheel cranks.

The side rods are simply made from pieces of 1/16th-inch x 3/16th-inch brass. The ends can be rounded in much the same way as the wheel-crank ends (**Photo 91**).

You'll also need four washers or spacers with a one-eighth inch diameter hole. I couldn't find any, so made them on the lathe as per the drawing in Part One (**Photo 92**).


Photo 97

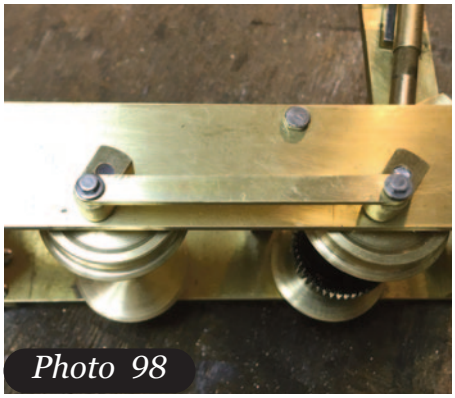


Photo 98

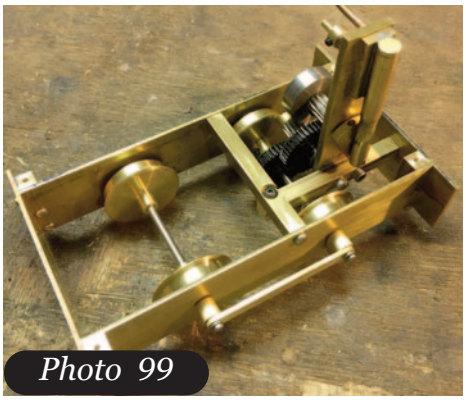


Photo 99

All that remains in this section is final assembly. Remove the axle with the gear on it, then reinsert it, first through the frame, then through a wheel (between the frames), then through the gear, the other wheel, and through the other frame. Don't tighten the gear or wheels yet. Do the same with the other axle, less the gear. Slip a washer onto the outside ends of each of the axles, then slip on the wheel cranks (**Photo 93**).

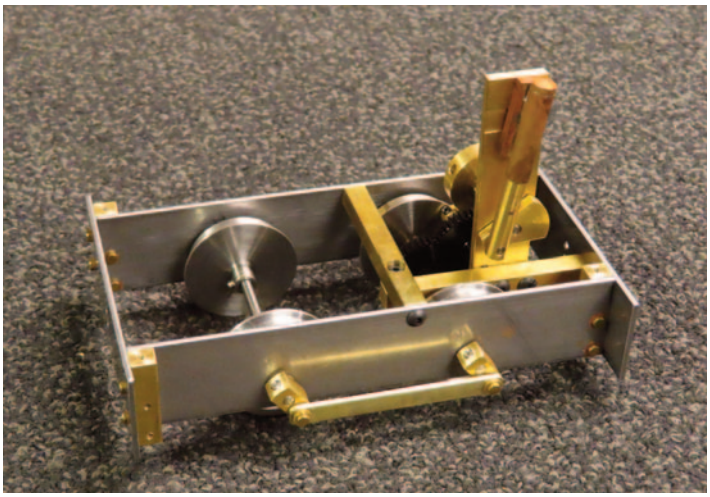
The wheel cranks need to be set 90 degrees out from one another, one side to the other. There are many ways to do this. A fairly simple one is to tighten the screws on the cranks on one side, then clamp a straight bar across those cranks (**Photo 94**). Then, using a small square, or something that you know to be square, vertically position (up or down—it doesn't matter) the cranks on the other side (**Photo 95**) and tighten the screws.

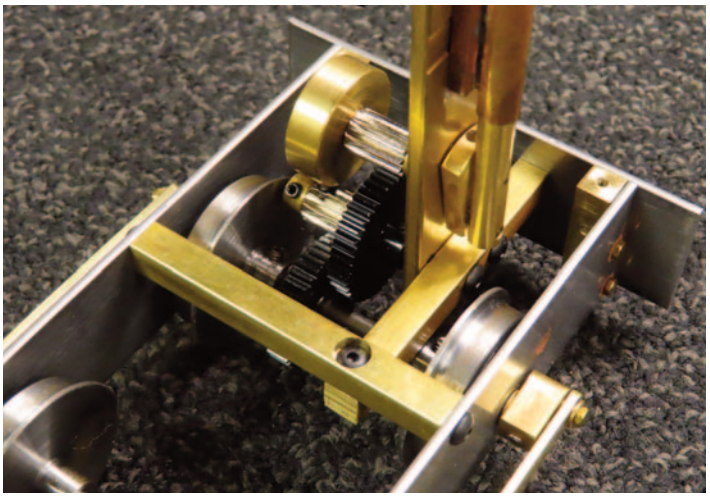
Now is a good time to gauge the wheels and fasten them to the axles. The back-to-back spacing of the wheels should be 1.575-inch. Start by measuring the space between the frames. From this, subtract the thickness of two wheels (not including the hubs), then subtract 1.575. Divide the result by 2. This number will be the distance from the inside of the frame to the outside of the wheel. Space the wheels on one side of the frame using this dimension and tighten the set screws. Then gauge the other wheels from these at 1.575-inch.

To mount the side rods, you'll need four **bearings** cut from a piece of one-eighth inch diameter brass tubing. You might be able to cut these on the lathe but I prefer using a jeweler's saw (**Photo 96**). You'll also need four #2 washers and four 2-56 x quarter-inch screws of your choice (**Photo 97**). Slip the washers onto the screws, then slide the bearings on after them. Put the side rods in position and run the screws into the cranks and tighten them up (**Photo 98**). The bearings fit inside the holes in the side rods.

The wheels should go around smoothly. If they don't, there are a couple of things to consider. The first is that one or more cranks are not perfectly set at 90 degrees. The second is that one or both side rods have been slightly misdrilled. If that's the case, and if the error is slight, the easiest solution is to open the hole on one end of a rod slightly. If the error is too great, the rods may have to be remade.

Once all is good and smooth, properly position the gear on the axle and tighten its set screw. You now have a running chassis (**Photo 99**). Next time we'll tackle some sheet metal.



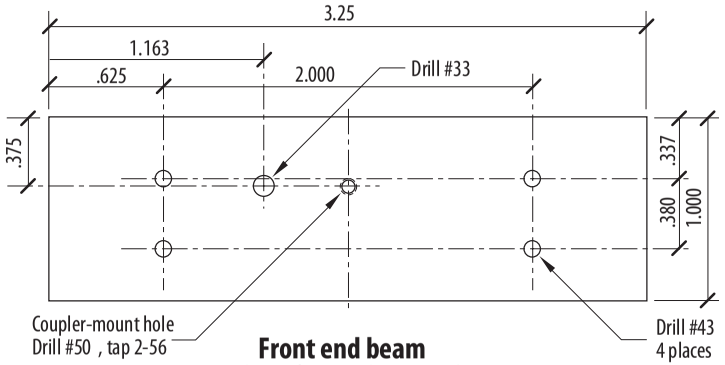


*Fellow live steamer Tom Winter is building along concurrently with Marc. Here are a couple of pictures showing his progress to date. Keep up the great work Tom!*

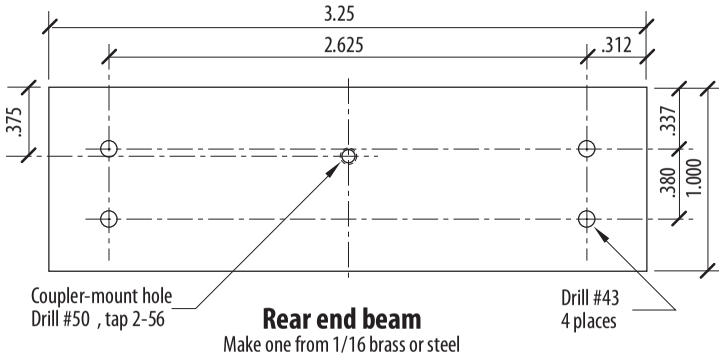
# SHEET C

## Wheels, axles, frame, couplers

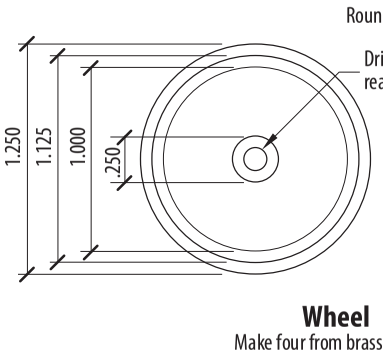
Sheet 3 of 6
Marc Horovitz
Date: 9-12-20



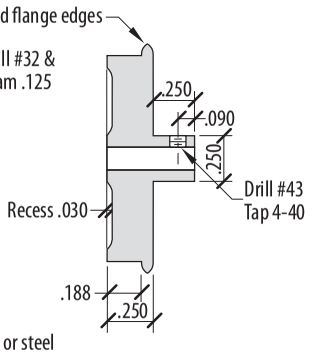

**Front end beam**
Make one from 1/16 brass or steel

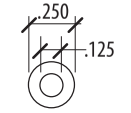



**Rear end beam**
Make one from 1/16 brass or steel

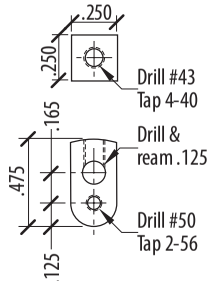



**Wheel**
Make four from brass or steel

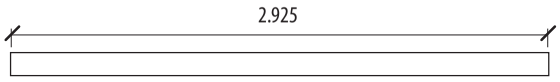



**Spacer**
Make four, brass or steel, .015 thick

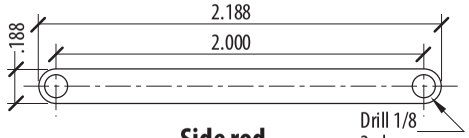



**Wheel crank**
Make four from brass or steel

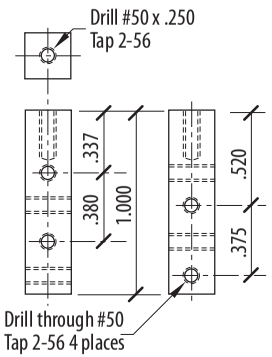



**Axle**
Make two from 1/8Ø steel

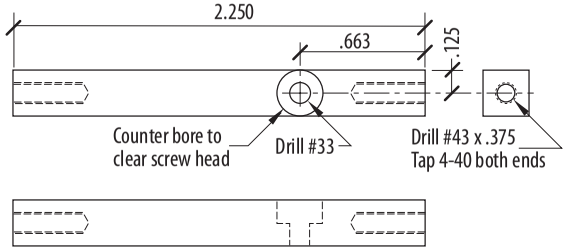

**Bearing**
Make four from 1/8Ø brass tube



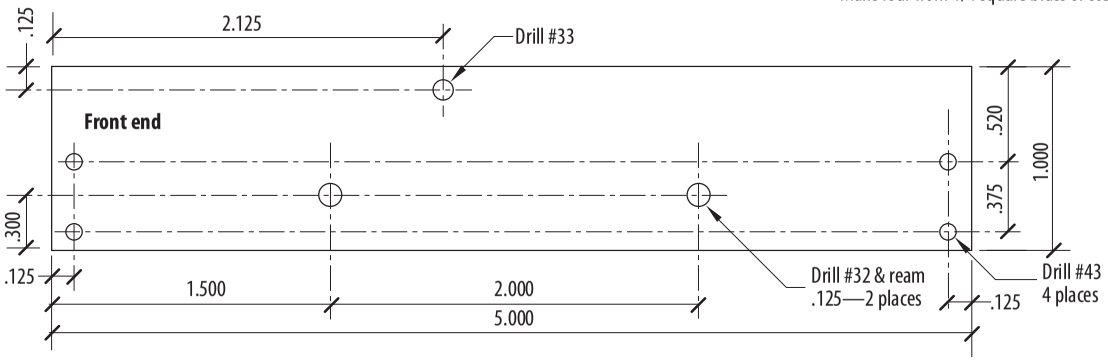

**Side rod**
Make two from 1/16 brass or steel



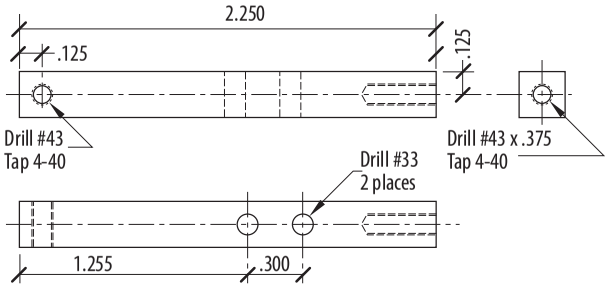

**Frame corner**
Make four from 1/4 square brass or steel




**Cross brace**
Make one from 1/4 square brass or steel




**Side frame**
Make two from 1/16 brass or steel




**Motor mount**
Make one from 1/4 square brass or steel

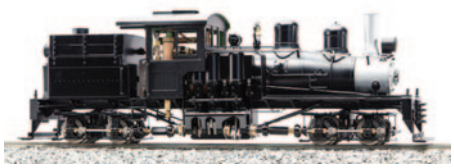
Live Steam Station is the newest and largest online store for all your live steam needs: Accucraft, Aster Hobby, Maxitrak, and mo

# LIVE STEAM STATION

ACCUCRAFT TRAINS
ELECTRIC & LIVE STEAM MODELS

QJ-Class, Butane or Electric
Butane $4500, Electric $4150


SR & RL or WW&F 0-4-4, 7/8th
Butane $3200, Coal Fired $4200



28T Shay, 1:20.3, Butane
includes 2 free logging cars
AC77-217 $2499


Ruby #1 and Ruby #2
Kit $559, RTR $599

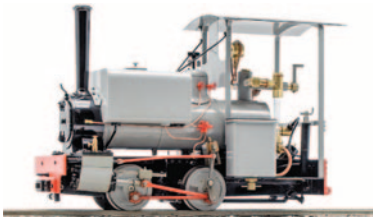

D&RGW C-25, 1:20.3
Butane/Ceramic $5250
Coal Fired, $5250

ACCUCRAFT UK LIMITED

Mannin #16, IOM 2-4-0T, 1:20.3
S20-1R Maroon, Butane $1950
S20-1G Green, Butane $1950


YEO, EXE or TAW
Butane $2166

Decauville, 7/8ths, Butane
Maroon $1650



Wren 0-4-0ST, 7/8th, Butane
S78-4GY $1775

Talyllyn No 1, 1:19, Butane, 45/32mm
Gauge. TR Green, Indian Red, Black
$1700

Adams Radial Tank, 1:32, Butane
Kit $1995, RTR $2160

## J&M Models

BR MK1 Coach
$275/Car

Smooth Sided Passenger Cars
$340/Car, $2040/Set

“Train Bleu” CIWL Sleeper, 1:32
$950/Car, $3800/Set

## New Projects Under Development

Southern Pacific P-8
1:32, Alcohol or Butane

D&RGW C-18 2-8-0
1:20.3, Alcohol or Butane

ore can all be found here. *www.livesteamstation.com* will replace *www.accucraftestore.com*. Visit us online and happy steaming!

# THE WORLD'S LARGEST STORE FOR MODEL STEAM TRAIN SUPPLIES

ACCUCRAFT · ASTER HOBBY · MAXITRAK · J&M MODELS · ARGYLE LOCO WORKS · AMS

ASTER HOBBY


LNER Thompson Class B1, Alcohol Fired
Kit $3100, RTR $3600

BR Standard Class 4-6-0 5MT, Alcohol Fired
Kit $3500, RTR $4600
RTR w/ 4 Mk1 Coaches $5700

USRA Mikado Heavy, Alcohol Fired
includes 6 Free Rolling Stock
Kit $4400, RTR $5500

USRA Mikado Light, Alcohol Fired
includes 6 Free Rolling Stock
Kit $3900, RTR $5000

Aster Tiger with Tender, Alcohol Fired
Kit $3250, RTR $3800

ARGYLE LOCO WORKS

C38 4-6-2, Streamlined, Green & Black
Alcohol RTR $4000

AMS

PEF Reefer, 1:32, $119

3-Bay Hopper, 1:32, $119

AAR Box Car, 1:32, $119

Rolling Stock, 1:20.3

Coach & Combine, 1:20.3

IOM G-Van, 1:20.3, $86

MAXITRAK
The best of model rail & road
Over 40 years of model making excellence

Sentinel DG6 Lorry, Butane
Blue, Maroon and Green $1580

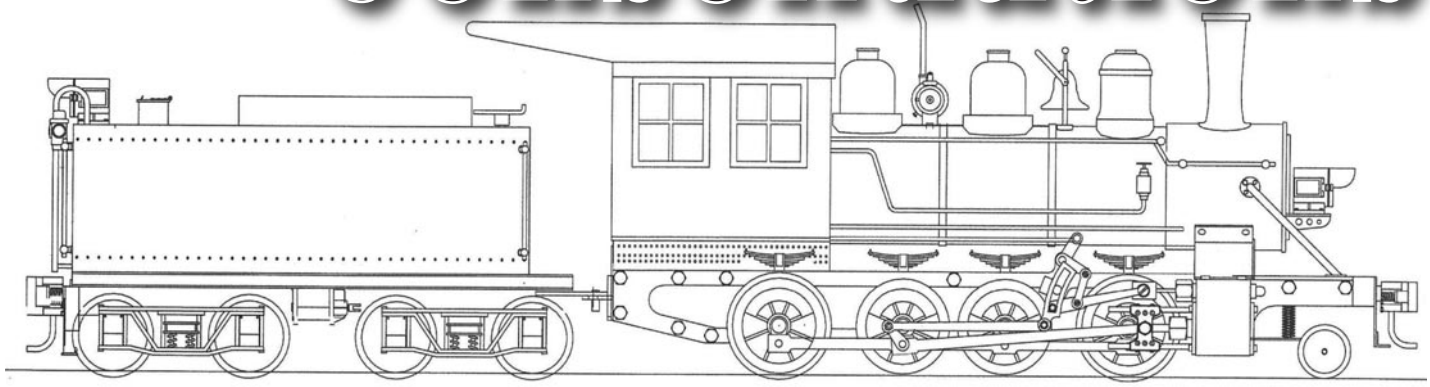
Allchin, 3/4" Scale, Butane
Black & Green Available $1415

ACCUCRAFT
RIDE-ON TRAINS

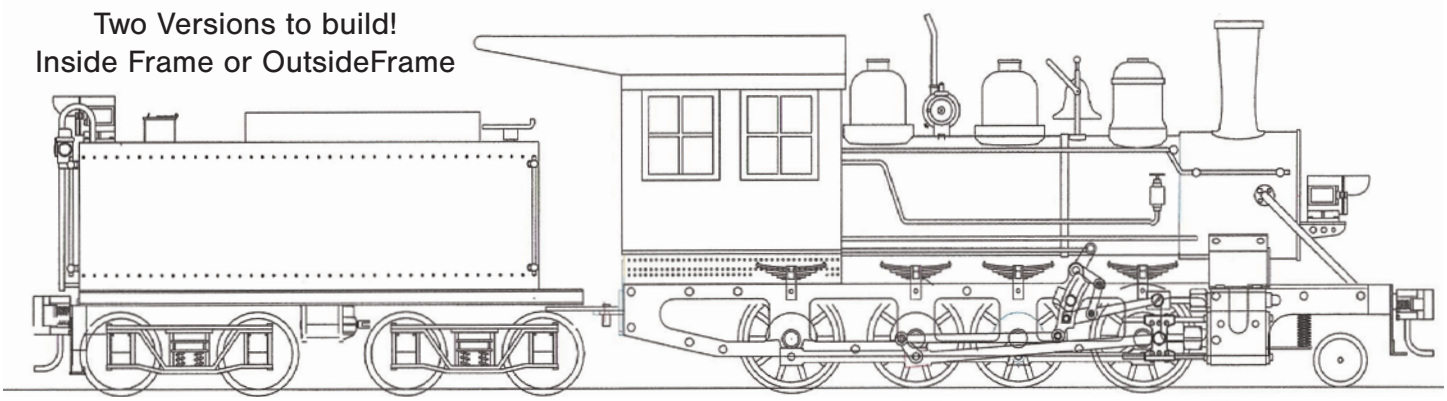
2-4-0, 2.5" Scale, Coal
T793-03 $18000

Workshop Project

# Freelance Consolidations



Two Versions to build!
Inside Frame or OutsideFrame



A New Build Series

## Part One

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

### Introduction

I often run live steam at the Apple Valley Model Railroad Club in Hendersonville, NC where they have an outdoor "G" scale layout. The live steam locos are quite a hit with club members and visitors alike and since I joined the club, several members have been bitten by the live steam bug, some rather hard! One day I brought a friend with me who is getting started in live steam and he saw a Bachman Spectrum 2-8-0 outside frame Consolidation running on the club layout (**Photo 1**). He said he would like to build a similar locomotive in live steam, only scaled down to be more of a short line, backwoods locomotive.

I've seen this Bachman locomotive before and always had a fascination with it. With the idea of building something like it in live steam, I immediately thought of Roundhouse Engineering's line of builder's parts. Most of the locomotives Round-

**Freelance Consolidations Construction Series**

- Part 1 - Intro & Mainframe.
- Part 2 - Lower works.
- Part 3 - Smokebox.
- Part 4 - Plumbing, Boiler and Steaming Accessories, Steam Test.
- Part 5 - Cab and Sheet Metal, R/C
- Part 6 - Tender

Photo 1

house produces are outside frame and their kits and parts are mostly geared towards this construction. It looked to me like a slightly scaled down Bachman Consolidation would turn out to be not much different than a Roundhouse Lady Anne with a lead truck and two more drivers, Americanized as I had done previously with my own Climax and most recently the Heisler as described in the construction article series in last years' *Steam in the Garden*. (See issues 160-165, March/Apr 2019 to Jan/Feb 2020.)

After some CAD work – actually LOTS of it – I came up with the preliminary design for such a locomotive, using all Roundhouse steaming components as I have done on other projects. They are just right for the job, and they just plain work well. I contacted Roundhouse about making some parts available to builders that are not usually shown in their catalog. These include chassis parts from their Sandy River locomotive. Roundhouse was most cooperative in offering whatever I needed as well as providing me with dimensional information vital to the design process. Those folks are always so cooperative!

The construction of this narrow gauge Consolidation basically follows the same form as the 2019 articles on the Heisler.

The locomotive will come in two flavors: outside frame and inside frame. At first I developed this locomotive to be a takeoff on the Bachmann outside frame locomotive, but since years ago I had developed a system of building inside frame locomotives from Roundhouse Engineering's outside frame components, our editor Scott McDonald suggested that an inside frame version of the locomotive would be desirable, too. After drawing it up, I wholeheartedly agreed; I really like the looks of the inside frame version as well. Except for spacers, axles, wheels and a couple of frame parts, all the parts for both versions are common. For all practical purposes, the articles on mainframe and lower works will be the only areas differing in the construction.

No machine tools are required for this project. The prototype was built with a drill press, bench grinder, rotary tool, small torch and hand tools. Sideframes, platforms, etcetera can be waterjet cut and the data necessary to do this is already on file with Denver Waterjet in Denver, NC. Any metal parts requiring cutting by the builder can be done with a rotary tool. This includes some screws which will have to be trimmed to length. Despite the extensive use of metric-based parts, no special tools are required. The M3 metric screws used to mate up with some Roundhouse components are fastened with a 5.5mm socket, sold at most hardware big box stores.

All steaming components are standard Roundhouse. All valve gear including the main rods are standard Roundhouse and the valve gear geometry is identical to Roundhouse six-coupled locomotives with an extra set of drivers tacked on the back. This means that all valve gear components will be provided in the Roundhouse valve gear kit. The only additional valve gear components needed are the "standard length" connecting rods from Roundhouse (ordered as a separate part) and a pair of connecting rods for the eight drivers for which plans and waterjet cutting data are provided.

**Mainframe Fabrication**

Anyone who has ever built a Roundhouse kit will find the construction of the mainframe and lower works to be nearly identical to assembling a Roundhouse Lady Anne kit or similar, with the ex-

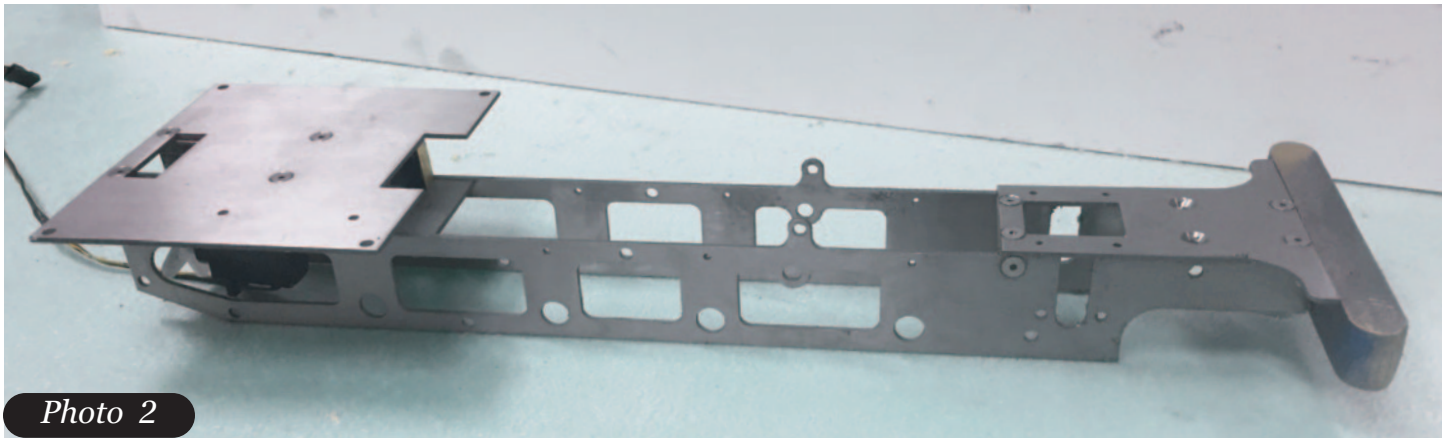


*Photo 2*

ception that a couple of parts must be fabricated by the builder.

A look at the mainframe drawings and numbering system will show that each part or assembly has a two or three letter prefix followed by a number or letter. For the mainframe, there are three prefixes, **MF**, **MFO** and **MFI**. The **MF** parts are those common to both the inside frame and outside frame locomotives. The **MFO** parts are unique to the outside frame locomotives and the **MFI** are unique to the inside frame locomotives. The numbers that follow are for parts and sub-assemblies. If letters follow, such as in **MFI-A**, it indicates an assembly drawing. In future articles, there will be additional prefixes such as **LW** for lower works, **SB** for smokebox,, etcetera.

Looking at the part numbering you will notice that some numbers are skipped in the two configurations. This is because in the mainframe, several constructions differ slightly, some requiring one part, and others requiring other parts. There are gaps in the numbering system so that part numbers can run parallel to each other, that is, a part number in one configuration has the same function as the same part number in the other configuration.

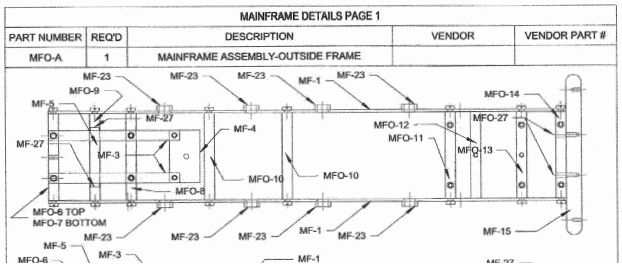
In several cases quantities of hardware items are different for the two configurations. The differences are indicated on the drawings.

An initial look at the mainframe assembly drawings **MFI-A (Figure 1-1) and MFO-A (online)** show that each has both its two main views drawn twice. This is so that one set of views clearly shows the assembly of the spacers and cab platform mounts, and the other shows the mounting of platforms and springs. Note that the equalizer springs and the screws that mount them are only used on the outside frame version.

Sideframe **MF-1 (Figure 1-2),** is quite a complex part; so much so that it also is drawn twice; once for frame fabrication and again showing all the various holes.

If fabrication of this complex part seems daunting, not to worry, the CNC data for this and all other major fabricated plate and sheet steel parts is on file at Denver Waterjet in Denver, North Carolina. Parts can be ordered by the part number shown in the bill of material. Both frame parts and cab parts will be available through Denver Waterjet. Mr. Peyton Smith of Denver Waterjet has been most helpful in the development and prototyping of this project, as he was with the Heisler project (**Photo 2**).

Most of the frame parts except spacers and the front plate are common to both configurations. The methods of attaching cab, boiler, lower works, R/C servos and just about everything else are common to both configurations. Most all parts have numeric equivalents in both configurations. Note that the first nine drawing pages cover the outside frame configuration and common parts, while the


MAINFRAME DETAILS PAGE 1

| PART NUMBER | REQ'D | DESCRIPTION | VENDOR | VENDOR PART # |
|---|---|---|---|---|
| MFO-A | 1 | MAINFRAME ASSEMBLY-OUTSIDE FRAME | | |

*Editor's note; Due to space limitations for printing, we are only showing the drawings specific to the "Inside Frame" version assembly & fabrication parts. All drawings for both versions are available online at www.steamup.com After logging in with your User Registration, (free), follow the "Workshop Plans" menu.*

**Brief History of a Desert Narrow Gauge Consolidation**


*Death Valley Railway 2-8-0 Inside Frame Consolidation in retirement at Furnace Creek, CA.*
*Brian Snelson Photo*

The Death Valley Railroad (DVRR) line was built by a separate company from Pacific Coast Borax Company, because PCB was struggling with financial issues at the time. Equipment and No. 2 Heisler "Francis" from the Pacific Coast Borax Company's Borate and Daggett line were used to build the Death Valley Railroad.

After the line was completed, two 2-8-0 steam locomotives were bought from the Baldwin Locomotive Works to work the line and Francis was sold off to a logging company. The specs called for the Consolidations to negotiate 20-degree curves and 1 1/2 percent grades on 56 lb/yard (28 kg/metre) rails.

As the borax played out, the DVRR converted to a tourist road in 1925, bringing visitors to the converted miners' dormitories that now made up the Furnace Creek Inn. By 1929, US Borax decided to close down all operations. The last two trains to run were pulled by the two 2-8-0s on 21st February 1930.

The pair's new owner was United States Potash Company of Loving, NM. Both operated for that company until their retirements in January 1956. One wound up on display at Lake Carlsbad Beach Park in Carlsbad, NM while No. 2 was eventually put on display back in the Death Valley at the Furnace Creek Ranch Resort.

next four cover parts unique to the inside frame configuration, including a separate assembly drawing. Drawings and Parts list specific to the outside frame configuration are available for download at *www.steamup.com*.

Mainframe construction is straightforward. The sideframes, cab platform, front platform and cab mounting parts are cut out, drilled and tapped, then assembled using the fasteners indicated. If you purchase waterjet cut parts, the threaded holes will not be tapped, but a hole approximating the tap drill size is been put in. The holes may come slightly undersize so you might want to run these holes out to their full size before tapping since the material is stainless steel. With this in mind, tap drill callouts are slightly larger than standard because the material is stainless steel. Broken taps are no fun to remove.

The frame spacers come from Roundhouse Engineering in either 55mm width for the outside frame or 33.5mm width for the inside frame, and mounting holes are to be drilled and tapped in them as required in the individual detail drawings. Some of the tapping operations may seem ques-

tionable at this stage of the construction, such as re-tapping the M3 threaded holes in **MFO (MFI)-10**. The reasons for this will be evident in the assembly of the lower works in the next installment. Several screws will have to be shortened using a rotary tool since these special lengths are not commercially available. There are some areas where assembly clearances are tight, especially in the inside frame configuration.

The axle bushing **MF-24** is the same part for either inside frame or outside frame configuration, but on the outside frame configuration, the bushings are pressed from the outside while on the inside frame, the bushing is pressed from the inside. The drawings **MFO-A** and **MFI-A** clearly illustrate this. This follows Roundhouse construction exactly, and until Roundhouse personnel told me that they oriented their bushings differently for inside and outside framed locos, I could not see how their inside framed locos went together!

The attachment of the equalizer springs also differs between configurations. On the outside frame configuration they are attached from the outside of the frame, like the axle bushings, but on the inside frame configuration the mounting method is reversed for the three front pairs of springs, and for the two rear springs, a mount is provided via holes in the cab platform supports **MF-3**.

You may wish to pre-paint the mainframe parts before assembly. The choice of paints is up to the builder, but recently I have had success with Krylon Fusion All-in-One Matte Black. Surfaces are thoroughly cleaned using acetone or other methods, then roughed with 300-600 grit sandpaper. Paint is applied per manufacturer's instructions with multiple light coats. Use three to four light coats just minutes apart, then let dry for 24 hours. Finish with several coats of Rust-Oleum 2X Matte Clear applied per instructions, and then leave to dry another 24 hours. You might choose to paint the mainframe in its entirety after assembly since it may well never be disassembled. In that case reaming out the bearings 0.250 or 0.251 inch (oversize) might be a good idea to get rid of paint on the inner bearing surfaces.

The assembly of the mainframe is very similar to Roundhouse locomotive kits. To press in the bushings, place a frame side on a piece of soft wood and press the bushing in either by tapping gently with a hammer, or mounting a small piece of wood, the frame side and the bushing in a vise and slowly pushing the bushing in by closing the vise. You might also try using your drill press as a makeshift bearing press. The bearing holes in the sideframes as received from Denver Waterjet were virtually perfect and no reaming was necessary. Several holes were actually slightly oversized, but there's a fix for that as you will see later.

After bushings are installed, prop up the side frames and pass quarter-inch rounds or the actual axles themselves through the front and rear pairs of axle bearings to align the frames.

If you want to "jump the gun" a bit on the lower works parts, you can order four Roundhouse ACA#24 axles, one set with cranks fitted, or if building the inside frame configuration, four Walsall Industries #G1700 standard 40mm axles. You can then use the axles as alignment guides in putting the mainframe together. The wheels themselves can be ordered at a later time. See Bill of Materials #2 at the end of this article

With axles turning freely in the bushings, put in a frame spacer first on one end of the frame, then the other, substituting the screwdriver slot screws provided by Roundhouse with MF-25 hex head M3 screws for a more locomotive-like look. Note that in the inside frame version, shortened M3 screws are used in mounting spacers at either end.

Leave the mounting screws slightly loose. Check to see if the axles still turn freely. Install the rest of the spacers, working your way to the center of the frame from each end. Keep the spacer screws just slightly loose and make sure the axles/rounds still turn freely. When the axles turn as freely as possible, tighten down the spacer screws.

If axles do not turn freely, try line-reaming the pairs of bushings for each of the axles by passing a 0.250-inch or 0.251-inch oversize reamer through both bushings.

If axles still bind after a line ream, take the axle out of the mainframe and reduce its diameter by a thousandth or so. Chuck one end of the axle in a drill press and spin it while holding tightly wrapped sandpaper around the axle. Work your way from moderate to fine sandpaper, ending with 600 grit. Don't forget to re-chuck and do the opposite end. There was definite binding in the prototype build, and this procedure made the axles free running.

## Bill of Materials for Mainframe

**From: Denver Waterjet**
3865 N. Highway 16
Denver, NC 28037
Attn: Peyton Smith
(980)222-7515
Peyton@denverwaterjet.com

| | | |
|---|---|---|
| 2 | LRK280/MF-1 | Mainframe sides |
| 1 | LRK280/MF-2 | Cab Platform |
| 1 | LRK280/MF-4 | Boiler Mount Plate |
| 1 | LRK280/MF-16 | Rear Plate |
| 1 | LRK280/MFI-17 | Front Platform (Inside Frame Version Only) |
| 1 | LRK280/MFO-17 | Front Platform (Outside Frame Version Only) |
| 2 | LRK280/LW-1 | Side Rods |
| 1 | LRK280/LW-2 | Pilot Truck Frame |

**From: McMaster Carr**
https://www.mcmaster.com/

| | | |
|---|---|---|
| 1 Pack | 92314A401 | Hex head screw 2-56 x 3/16” |
| 1 Pack | 90729A167 | Undercut flathead screw M3 x 0,5 x 8mm |
| 1 Pack | 92210A107 | Flathead screw 4-40 x 5/16” |
| 1 Pack | 92210A113 | Flathead screw 4-40 x ¾” |
| 1 Pack | 90128A108 | Socket head screw 4-40 x 3/8” |
| 1 | 8954K411 | BAR, BRASS .250” x .500” |
| 1 | 8951K13 | SQUARE, BRASS .250” X .250” |
| 1 | 8954K211 | BAR, BRASS, .500” x .625” x 6.00” |
| 1 | 8951K02 | BAR, BRASS .0625” x .375” |

**From: Roundhouse Engineering**
011 44 1302 328035
Attn.: Andy or Harri
https://www.roundhouse-eng.com/

**Mainframe**
9 Frame spacers 55mm Roundhouse “FS” - Outside frame version only
9 Frame spaces 33.5mm Roundhouse “FS” - Inside frame version only
2 4-pac of axle bushings Roundhouse AB4

**From: Precision Scale Co.**
P.F. & S Railway Supply Inc.
560 Ione Road
Pasco, WA. 99301
Phone: 509-528-9711
Email: precisionscaleco@gmail.com
Web: https://www.precisionscaleco.com/

1 Pack of 8 9825 Equalizer Springs

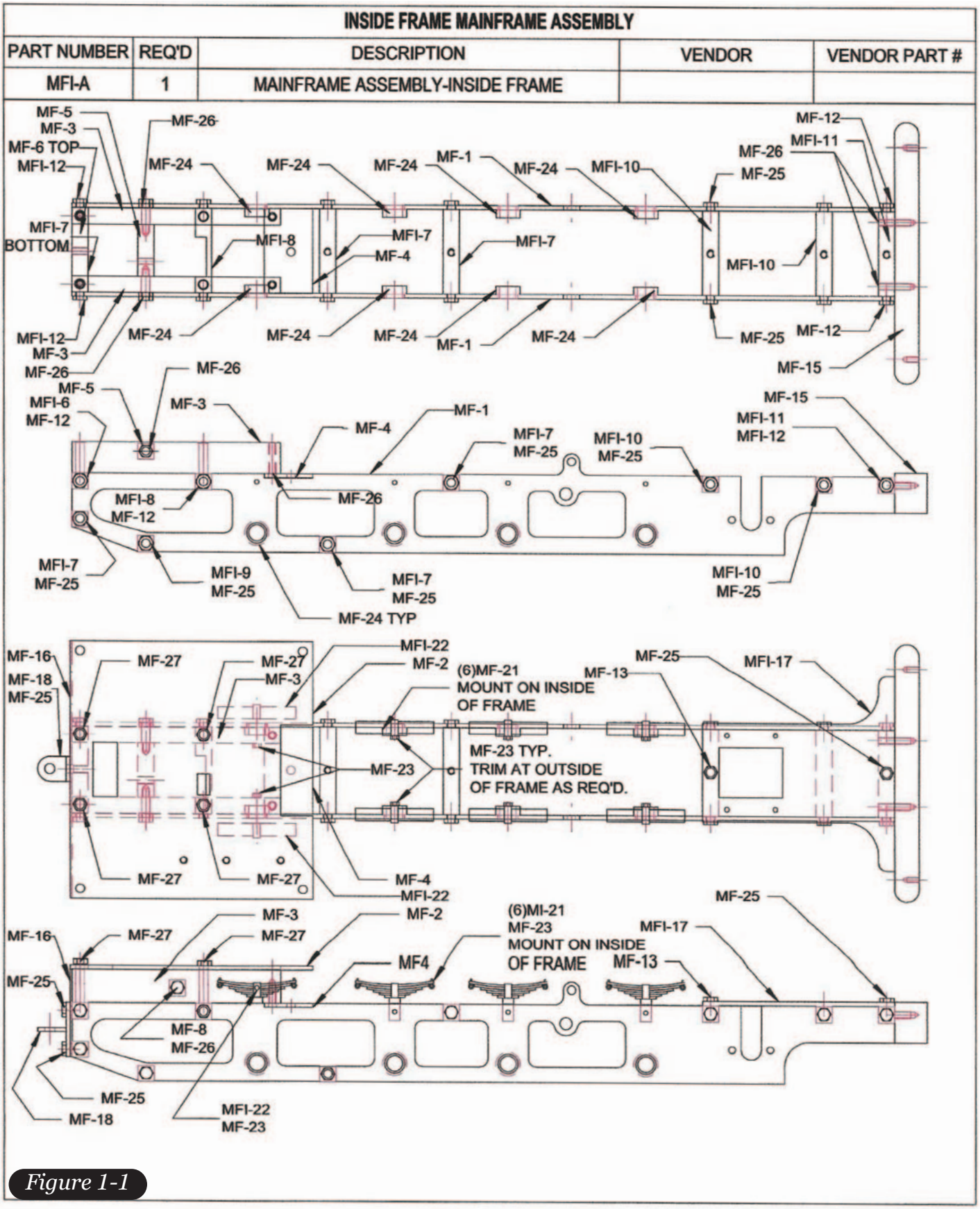



*Figure 1-1*

If bushings themselves appear loose in the sideframes with axles mounted in them, remove the bushing, apply Threadlocker Red to the bushing where it is pressed in, and press it back into the frame, with the axle in place and freely rotating as a guide.

After the frame sides and frame spacers are assembled, the cab platform assembly can be put on.

| MAINFRAME DETAILS PAGE 2 | | | | |
|---|---|---|---|---|
| PART NUMBER | REQ'D | DESCRIPTION | VENDOR | VENDOR PART # |
| MF-1 | 2 | 1/16" x 2.00 CARBON STEEL | MCMASTER CARR | 6511K151 (3 FT) |
| MF-1 (ALT) | 2 | .060 STAINLESS STEEL | DENVER WATERJET | LRK280/MF-1 |

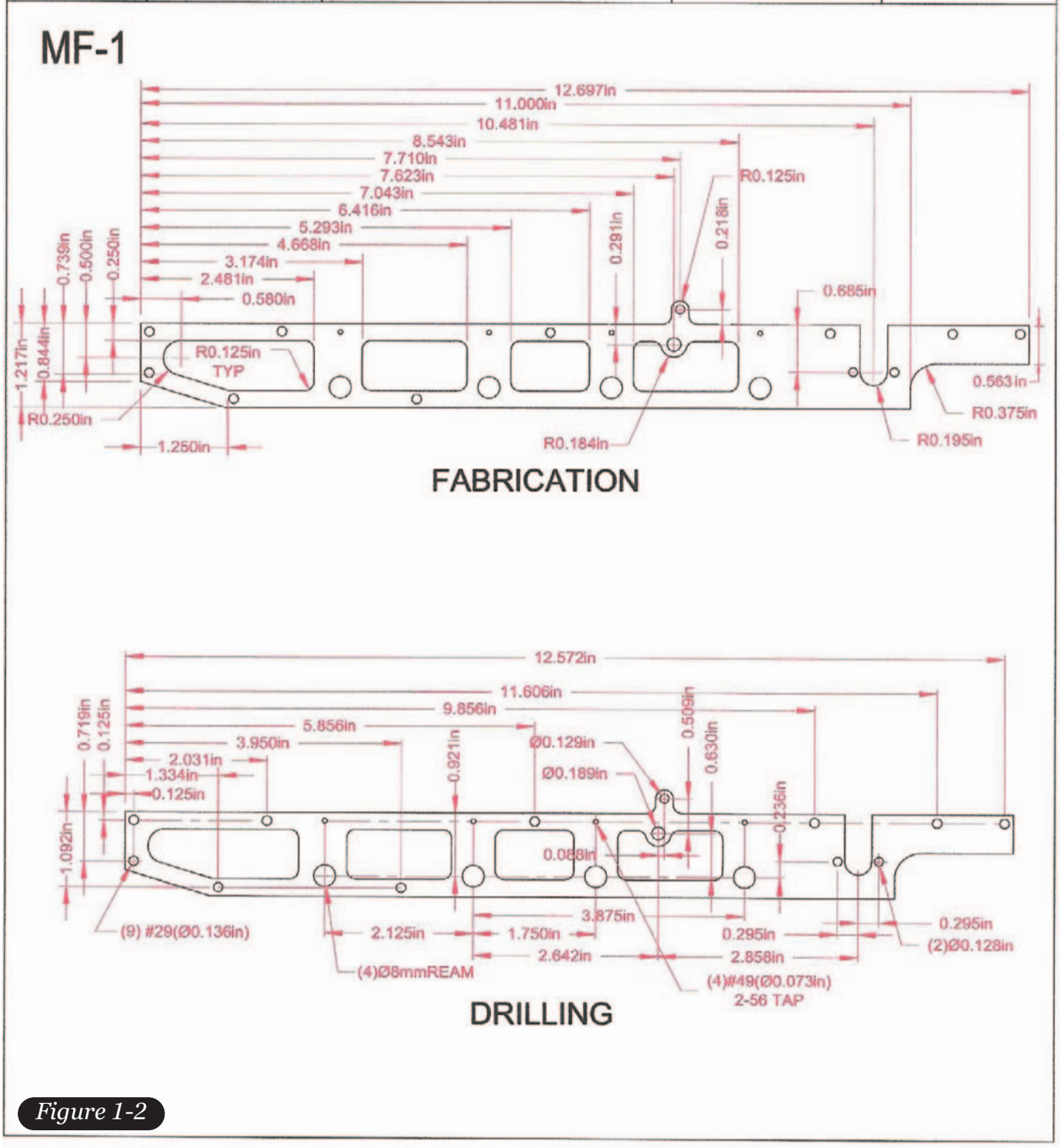



*Figure 1-2*

Start with the two parts **MF-3** which you can cut from brass bar with a rotary tool. Don't worry about edge finish, exact perpendicularity of the ends, or even exact length, as long as the back end is no longer than shown in the drawings. The most critical features are spacing of the holes. Put the two **MF-3** parts on top of the frame spacers and attach **MF-5** with screws **MF-26**, then pass screws **MF-**

| MAINFRAME DETAILS PAGE 3 | | | | |
|---|---|---|---|---|
| PART NUMBER | REQ'D | DESCRIPTION | VENDOR | VENDOR PART # |
| MF-2 | 1 | 1/16 X 4 X 4 CARBON STEEL | MCMASTER CARR | 1388K144 |
| MF-2 (ALT) | 1 | .060 STAINLESS STEEL | DENVER WATERJET | LRK280/MF-2 |

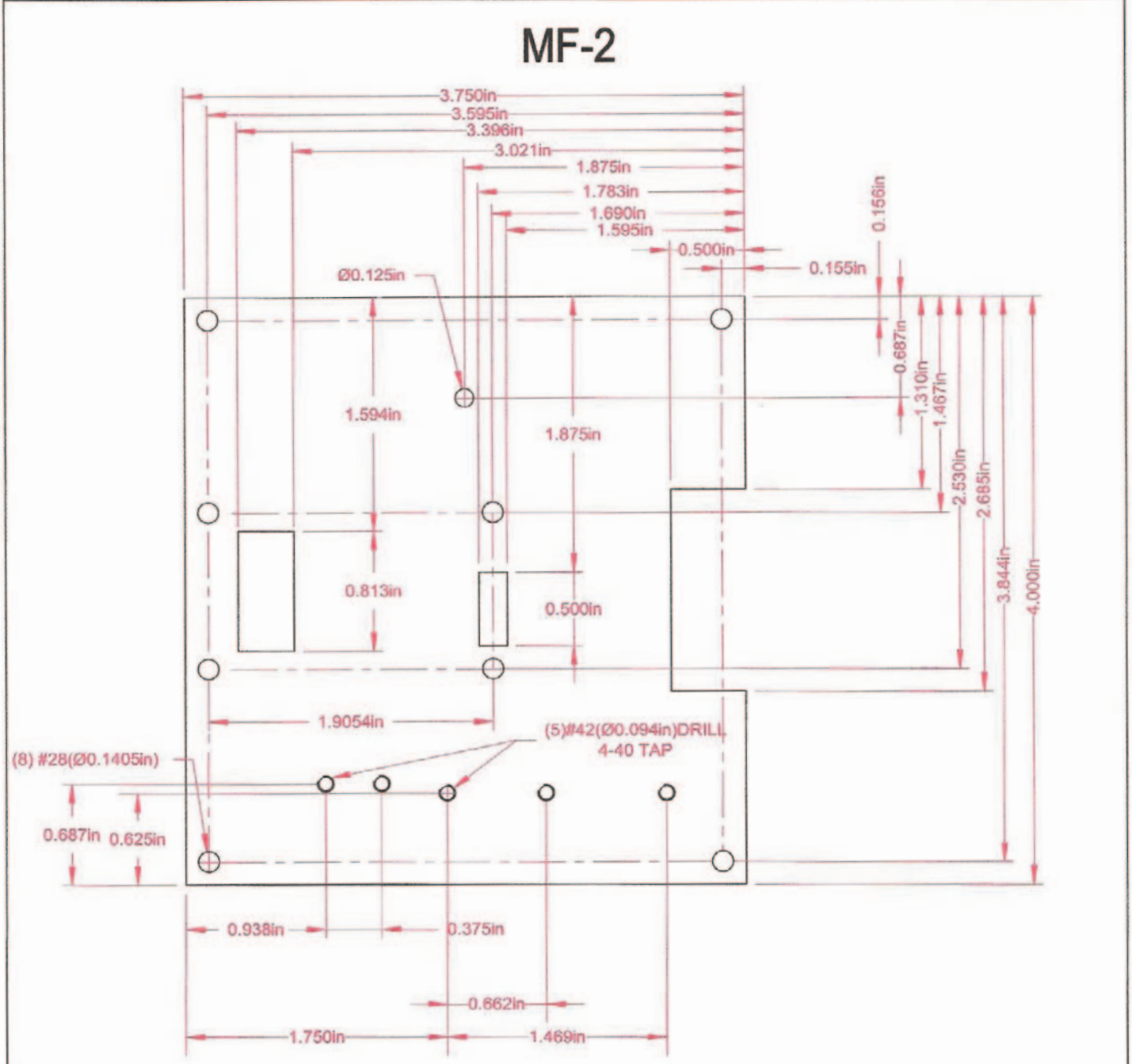



*Figure 1-3*

**27** through the cab mounting plate **MF-2**, through **MF-3** and into spacers **MFO** (or **MFI**)**-6** and **MFO** (or **MFI**)**-8**. Finish with the rear plate **MF-16** and tender coupler assembly **MF-18**. After this, install **MF-4**, the plate to which the boiler mount will be attached. When completed, the cab mounting plate **MF-2** should overlap the rear plate **MF-16** and their edges should form a corner (**Photo 3**).

| INSIDE FRAME MAINFRAME DETAILS PAGE 4 | | | | |
|---|---|---|---|---|
| PART NUMBER | REQ'D | DESCRIPTION | VENDOR | VENDOR PART # |
| MFI-17 | 1 | .060 MILD STEEL OR STAINLESS | RACE CITY STEEL | |
| MFI-17 (ALT) | 1 | .060 MILD STEEL OR STAINLESS | DENVER WATERJET | LRK280/MFI-17 |
| MFI-22 | 2 | EQUALIZER SPRING | PRECISION SCALE | 9825 |

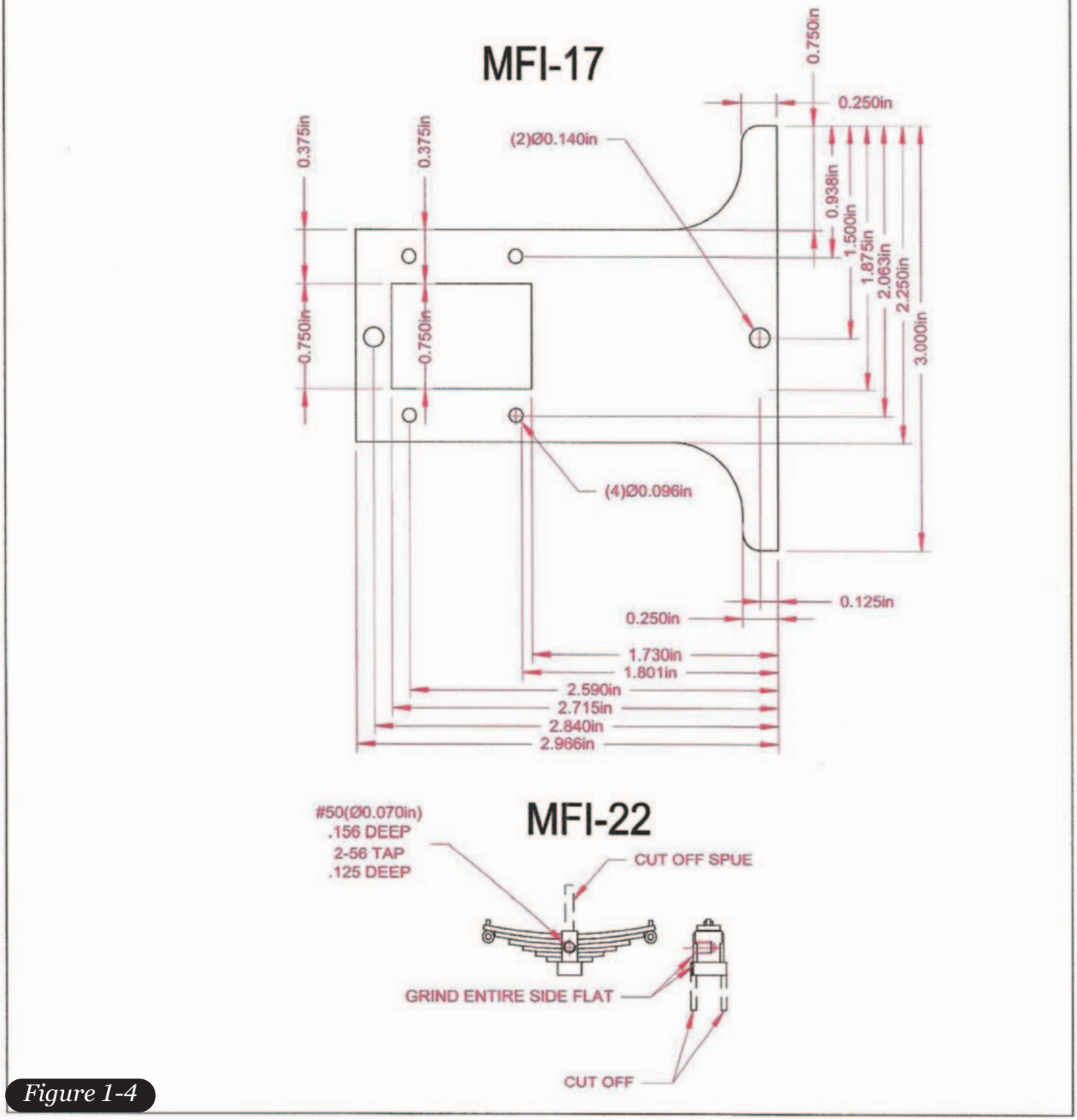



*Figure 1-4*

The front end is basically the same construction, but a bit simpler. With frame spacer **MFO** (or **MFI**)-**11** in place, bolt in the front pilot beam **MF-15**. After that bolt in the front or pilot plate **MFO** (**MFI**)-**17** with hex head screws **MF-26** at the front and **MF-13** at the rear (**Photo 4**). Note that you will want to remove the pilot plate when assembling the cylinders and superheater piping to the mainframe.

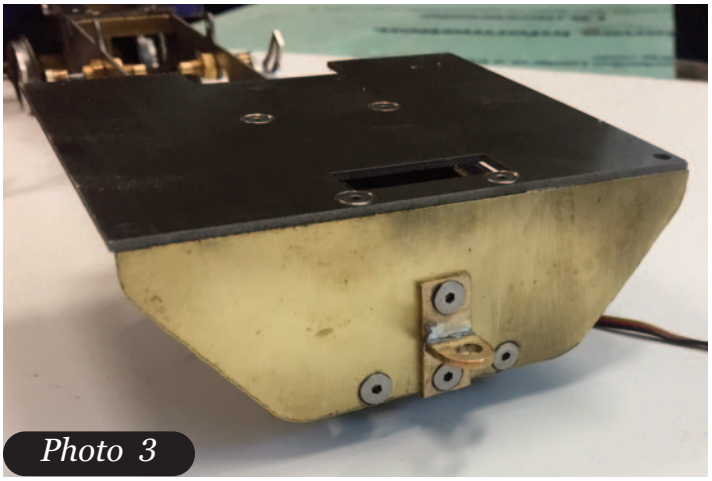


*Photo 3*

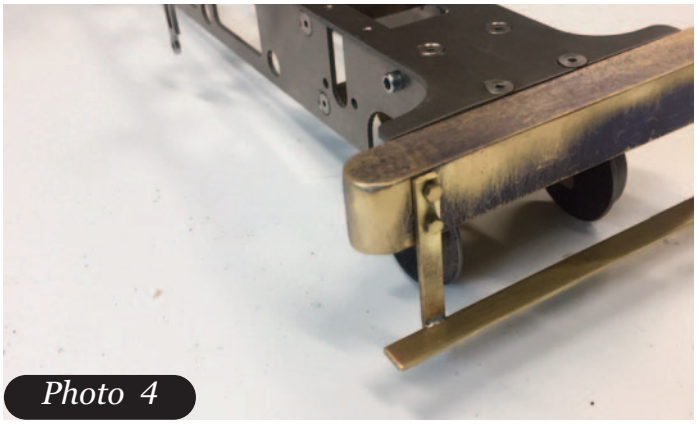


*Photo 4*

This is covered in the next installment when we will add the mechanism to the mainframe, turning it into a rolling chassis (**Photo 5**). Axles, wheels, connecting rods, cylinders, valve gear and all such related parts will be added and the valve gear timed in by the simplest method imaginable. If you have an air compressor (you should have one available for this project) you will then be able to make your creation move under its own power.

## Bill of Materials for Next Installment - Lower Parts - Part Two

**From: McMaster Carr**
https://www.mcmaster.com/

| | | |
|---|---|---|
| 1 | 8859K87 | BAR, BRASS .064” x 1/4" |
| 1 Pack | 9657K73 | SPRING, .218” OD .173” ID .023 Wire DIA. 1” LONG |
| 1 | 8859K21 | TUBE, BRASS, .128” ID .014” WALL |
| 1 Pack | 92196A117 | SOCKET HEAD SCREW 4-40 x 1 1/8” |

**From: Roundhouse Engineering**
011 44 1302 328035
Attn.: Andy or Harri
https://www.roundhouse-eng.com/

Outside Frame Version Drivers & Axles:
4 Drivers, 42mm, flanged “Sandy River” Spoked. Roundhouse (no part number given)
4 Drivers, 42mm, un-flanged “Sandy River” Spoked. Roundhouse (no part number given)
3 Axle sets with counterweights Roundhouse ACA#24
1 Axle set with counterweights, cranks fitted. Roundhouse ACA#24

Inside Frame Drivers and Axles:
4 Walsall Industries #G1700 standard 40mm axles (https://www.walsallmodelindustries.co.uk/)
4 Walsall Industries #1871 Machined drivers. 42 mm tire dia. 46mm flange dia. coarse machining option. 5/16” crank throw. Crank hole threaded 6 BA. 3/8” scale.
2 Walsall Industries #1871 Machined drivers. 42 mm tire dia. BLIND No flanges. Coarse machining option. 5/16” crank throw. Crank hole threaded 6 BA. 3/8” scale.
2 Walsall Industries #1871 Machined drivers. 42 mm tire dia. BLIND No flanges. Coarse machining option. 5/16” crank throw. Crank hole drilled 2.5mm dia. (or #38 drill if available) 3/8” scale.

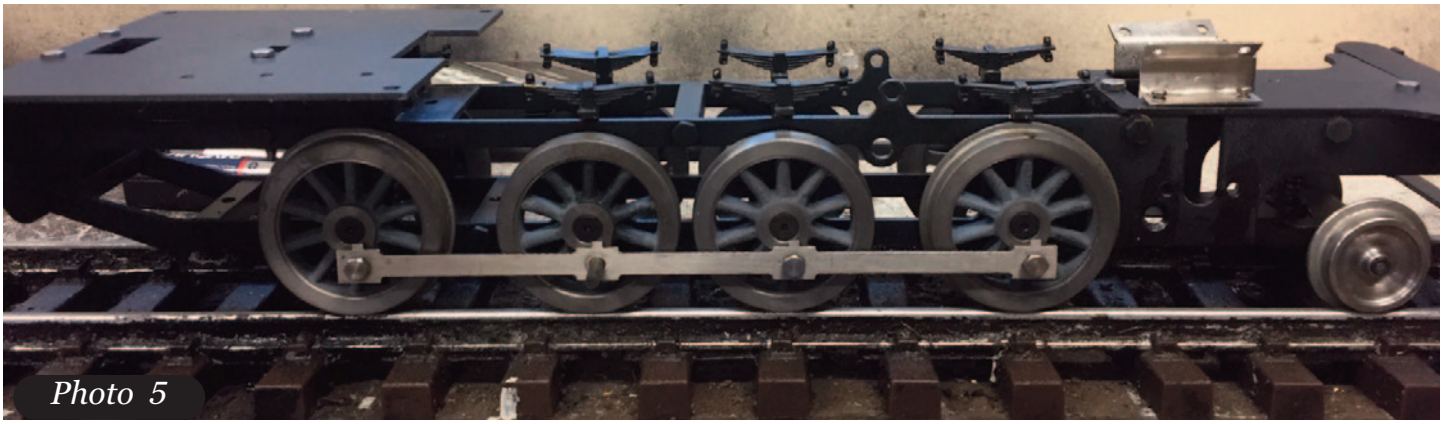


*Photo 5*

Both Versions:

1 Axle and wheels for “Sandy River” pilot truck. Roundhouse (no part number given - either version)
2 packs Crank Pins. Roundhouse CPS6
1 Cylinder assembly (2). 9/16" bore x 5/8" stroke. Slide valve type. Roundhouse “C”
1 Walschaerts valve-gear set (for two cylinders). Roundhouse WVG
2 Standard Length (101.6mm) Connecting Rods


TRAINZ

Trainz wants your collection! With over 45 years of experience, we make it easy to sell your collection.

**sellmytrains.com/sig**
**(866) 433-0565**


Looking for a great selection of new and used trains in every scale?
**Visit trainz.com**



ASTER HOBBY

ACCUCRAFT TRAINS

North Jersey Gauge One

*Authorized Aster and Accucraft Dealer*


Contact: Jeff Koenig - northjerseygaugeone@yahoo.com
28 Old Route 84, Wantage, NJ 07461
(973) 943-7371

LIVE STEAM GAUGE ONE LOCOMOTIVES

# Further Thoughts on Coal Firing

by Jeff Young

## Introduction

I last wrote about my coal firing experiences in *Steam in the Garden* back in early 2007 (January/February, Issue 91). Our esteemed editor asked if I would update my article. The number of coal burners polishing the rails has increased dramatically, with both ready-to-run coal and a number or coal firing conversions available. In the intervening years, a lot of coal has passed through the fire box door and further insights have come to light.

## The Starter Fire

Coal is difficult ignite on its own, especially in the tiny fire boxes of our small scale locomotives. A good hot "starter fire" is needed first, then coal is added. A fuel that burns a little easier is used, namely hard charcoal which has been soaked in a combustible fluid. Charcoal intended for the barbecue grill is soft and will burn too quickly. Crushing it to the proper size is a messy proposition and it seems that you end up making more dust than useable right-sized pieces. Horticultural charcoal remains the starter fuel of choice. Thanks to its hardness and slow-burning characteristics, it ensures that a good hot fire can be achieved before coal is added. In fact, your locomotive will run just fine on hard horticultural charcoal alone. It can be obtained from most good garden centers in either one or five pound bags. (Failing that, it can even be found on Amazon.) Typically, it comes in half-inch sized pieces and does not require crushing.

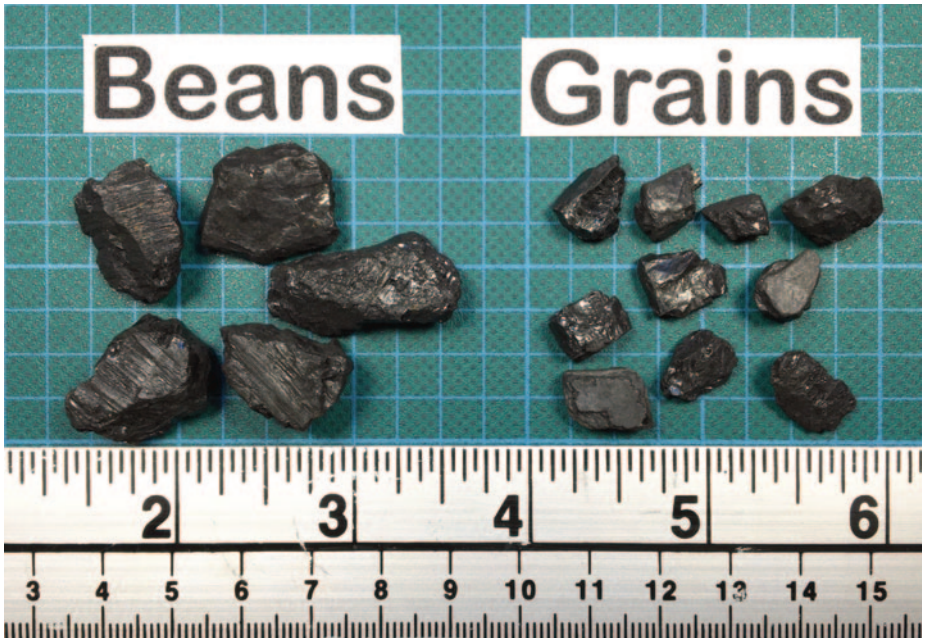
To help the charcoal burn even better, it is soaked in some sort of combustible liquid for a few days before using. Some folks use methyl alcohol, but I found that it drips everywhere, and very quickly you can have a fire in the cab, on your shovel, or worse, in the container of soaked charcoal. Kerosene does not seem to get all over the place like meths, but it has a very strong smell. I have had good success with unscented lamp oil. It burns well and is not irritating to either your nose or eyes. Quart bottles can be obtained at either camping supply or hardware stores. I keep a metal paint can with about a cup of lamp oil in it, and usually keep it filled with about the same amount of horticultural charcoal.

## Welsh Steam Coal

Welsh steam coal (a form of anthracite) is the fuel of choice for our small scale coal-fired locomotives. Coal for model steam locomotives is sized as either "grains" (typically 0.5-inch by 0.25-inch) or "beans" (typically 0.875-inch by 0.5-inch). Most of the 16mm scale and 1/32nd scale locomotives have small grate areas (my Shawe Fowler grate is 1.5-inch square), so grain size coal is best. Beans (or a mixture of beans and grains) can be used on models with much large fire boxes, such as in Colorado narrow gauge locomotives in 1/20.3 scale.

One thing that I have learned over the years is that there can be a quite a variation in the burning

characteristics of Welsh steam coal. My initial supply was quite soft and faster burning than the coal I currently use. As a consequence, I found I was having to use larger pieces (approaching bean size, which nearly filled the fire box) as it burnt quickly. Frequent stoking was required every five or so minutes.



*The comparison between beans and grains of Welsh steam coal.*

Fortunately, I am now using a slightly harder Welsh steam coal from Triple R Services, whose source can be traced back to the Ffos-y-fran mine near Merthyr Tydfil, Wales. It is available both grain and bean size. Using consistent grain size coal, I can run with a thinner, more even fire on the grate, and I find that it burns slower, resulting in a need for less frequent stoking (every ten minutes or more). One the characteristics of my Shawe locomotive is that even with a train behind, I have to run with the steam blower on to draw the fire, and just a bit more blower is required with the slowing burning coal from Ffos-y-fran.

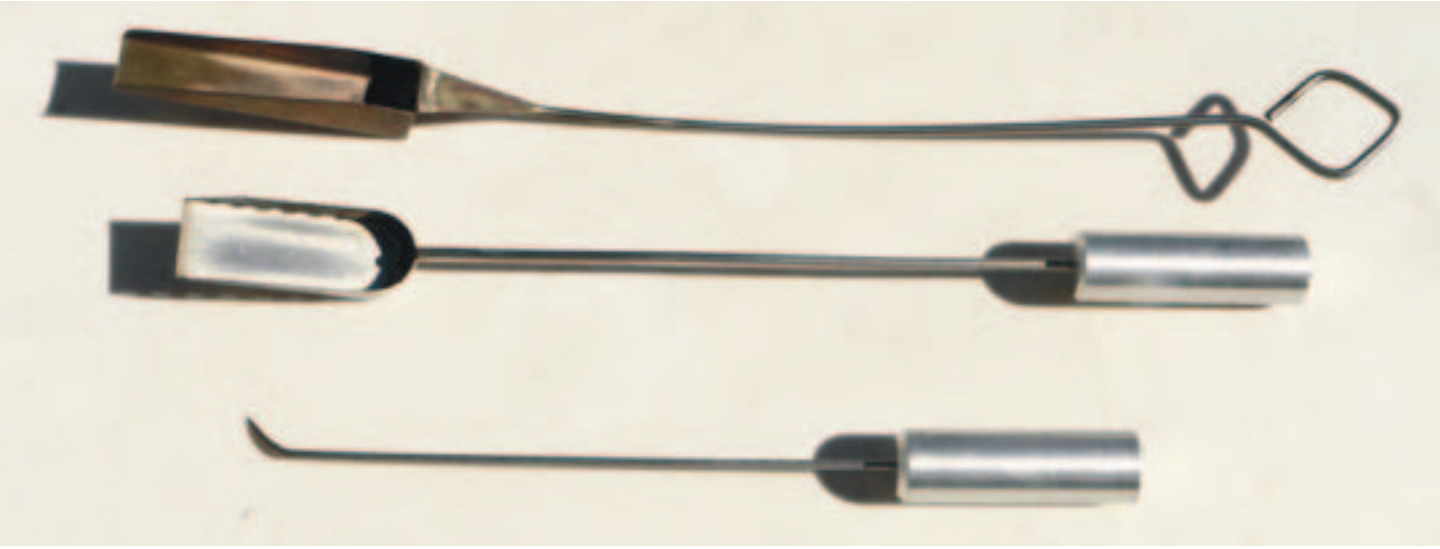
It is worthwhile to check the size of your coal supply to ensure that it is suitable for your locomotive's fire box. Using a screen or hardware cloth with appropriate sized openings, the oversize pieces are weeded out for crushing. Next, take a pair of vise grips, set the gap to the desired maximum dimension. Grab the oversize piece of coal with the vise grips and squeeze. If it is oversize in the other dimension, repeat the action with the vise grips. It's crude, but effective and makes less dust than pounding the coal with a hammer. The newly crushed coal is sifted with a piece of window screen to get rid of the dust.

## The Firing Process

The firing process follows the time-honored ritual. After ensuring that the boiler has sufficient water, the fire box is filled up to the bottom of the fire box door with soaked charcoal. (I make sure that I drain off the excess lamp oil from the charcoal before shoveling it into the fire box.) The suction fan is placed on the stack, the fire lit, the smoke box door is closed and the fan is turned on. I found that a decent lighter is beneficial to ensure that the fire catches throughout the fire box. I use a blow torch type of lighter.

To have a successful fire, you need three things: heat, fuel and oxygen. If you have a smoky fire with the lamp-oil soaked charcoal, it is likely that the fire is starved for oxygen, as smoke means incomplete combustion. The fire needs more oxygen. If this occurs when using your suction fan, the batteries probably need replacing.

After a few minutes, steam pressure will start to build in the boiler. Above about 20 psi, the locomotive's steam blower can be used and the fan removed. If you get a smoky fire after switching from the suction fan to the steam blower, turn up the blower a bit. The pressure builds rapidly as the blower draws the fire. Once the safety lifts, coal can be introduced to the fire. Open the firebox door briefly to ensure that there is a good hot fire.



*Tools of the coal firing trade: (Top) Two coal shovels — each designed for the specific depth of the firebox and width of the firebox door of a locomotive to ensure even coal distribution and to block excess air from entering while re-coaling. (Bottom) Coal pricker.*

The Achilles heel of small scale live steam coal firing is leaving the fire door open too long while tending the fire. When the door is open, cold air is drawn through the firebox door hole, killing the draft and suffocating the fire.

If the charcoal fire is good and hot, it is time to add some coal to the fire. I tend to pick out the smallest grains and put a layer of coal on top of the charcoal. Confident that the coal is alight, a bit more coal is added as the charcoal will soon completely burn away. With the fire now completely composed of coal, it is time to couple up the train. It might also be a good time to top up the tender with water before heading out on the main line.

After that, we can settle into the satisfying routine of adding a layer of coal as needed to the fire every ten minutes or so, meanwhile opening and closing the axle pump bypass valve to maintain the proper water level in the boiler. I found that with the good Welsh steam coal that I now use, I do not need to rake the fire with the pricker. The fire burns cleanly and the very small amount of ash will drop to the pan on its own.

## Post-Run Cleanup

I found that it is essential to throughly clean the locomotive after a run. Displaying my Fowler in a pride-of-place spot has nothing to do with it — the soot and grime buildup does affect the performance and wear. I find that vacuuming out the fire box and ash pan is a quick way to clean up the locomotive. When I brush the flues from the fire box end of the locomotive, I do so with the smoke box door closed and the hose from the shop vac over the stack. This way, the soot from brushing the tubes gets sucked out of the way. Speaking of the stack, check it occasionally for an accumulation of gummy residue (a combination of cinders and steam oil from the exhaust). The residue will eventually reduce the stack opening and affect the draft of the locomotive. A bottle brush dipped in brake cleaner or lighter fluid will remove it easily.

As a final touch, I like to wipe down the locomotive thoroughly, especially to get any of the cinders or ash out of the running gear. Perhaps it is the appeal of those gleaming vintage locomotives, but I also like my locomotive's glossy paint to shine. One product that I found that is particularly useful (recommended to me by a fellow live steamer) is Harley Davidson's "Harley Spray Cleaner and Polish". I spray a bit on shop towel and rub the locomotive down, so that it will be ready for its next run.

Running a coal burner comes with its own demands, but the resulting satisfaction shouldn't be missed by anybody ready to take this exciting 'next step.'

*With a good coal fire burning, the safety valve lifts on the author's coal-fired John Shawe Fowler.*


Details that bring your layout to life!

Ozark Miniatures

**Product lines**
- **Ozark Miniatures**
- **Precision Products**
- **Air-Ezze**
- **CDS Lettering**
- **Hartford Products**

Ozark Miniatures Inc.
David & Brenda Roton
*http://www.ozarkminiatures.com/*
3461 S 5225 W, Cedar City, Utah
84720 — 435-586-1036

**Hartfold Products Special: Buy 3 you get the 4th for free.**

*Hartford Products*

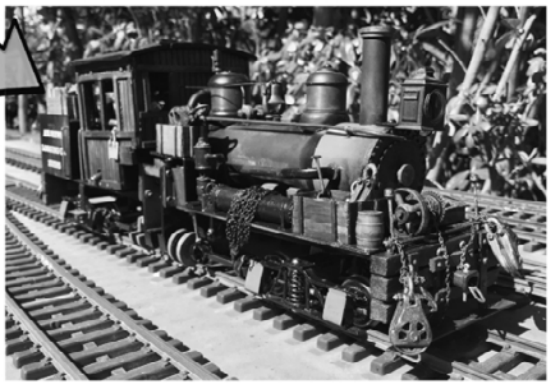
Southern Pacific Narrow Gauge 28-foot boxcar

Seattle Car and Foundry 22 ft. log car

Russell #2 Log Car

Take Your Locomotives from this

To This! with our extensive selection of scale details!



# THE CUPOLA VIEW

## Let's Get 2021 Rolling!

After what seemed like an eternity, I was able to attend a local steamup with a few friends this fall. The host usually has a couple of these a year, but this year with all of the concerns about health safety and social distancing, the normal schedule was put on hold. But we were finally able to get together and run trains. The weather was absolutely perfect and we had a safe, masked, fun weekend.

This whole pandemic thing hasn't deterred one of our faithful contributors. We welcome back Les Knoll of Denver, North Carolina with another series, this time to build a Consolidation. When we finished the Heisler series I said to myself that I was good with my stable of locomotives as I get closer to retirement from my day job and downsizing my collection. Of course those were famous last words as I figured that I will now need to add the Consolidation to the stable, and in my own fashion as another member of a famous desert railway, The Death Valley R.R.

As a child I ran all over the desert, in and around ghost towns as the family hobby was rock hunting. My dad was a budding lapidary hobbyist, my brother a young paleontologist in the works, (he's a full paleontologist now), Mom was our camp cook, which in retrospect, didn't really give her a day off on the weekends, and me, I was running around, camera in hand, looking for critters and cool photo compositions.

I've walked the old roadbeds of the Borate and Daggett Railroad, the Tonopah and Tidewater, and the Death Valley R.R. to name a few. All the while imagining a steam locomotive operating in the hot, harsh conditions to the bitter cold that happens when the heat leaches off the desert floor at night because there isn't any atmosphere to hold it in. The desert is a bitter mistress.

So now I am bringing those childhood memories back to life with these projects that Les is creating for us. The Freelance Consolidation project is a popular design upon which to build a number of various locomotives from different narrow gauge lines. Many of the techniques used in the Heisler series are repeated here, and with the main frames and such being waterjet cut, it's again a simple matter of assembly and very minimal fabrication.

*A bit of McDonald Family nostalgia - Out in the Southern California Mojave Desert rock hunting in and around the old desert railroad lines. Yup - that little kid up front with the cheesy smile is your editor.*

We also have Marc Horovitz's series on the Minitram to keep us busy into the summer. Two build projects to satisfy the creator in all of us. So we should be seeing a lot of new home-built locomotives on the tracks by the time we're all back into the normal swing of things and we all get to return to steamups.

Happy Steaming!

Scott

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


## Special or Annual Meets

**Cabin Fever Model Engineering Show January 2021 CANCELLED -** Lebanon Valley Expo Center & Fairgrounds, Lebanon, PA. Gauge One Tracks available for steaming. Visit *www.cabinfeverexpo.com* for more information about 2022.

**International Small Scale Steam Steamup. January 17-23, 2021 -** 103 Live Oak Drive, Diamondhead, Mississippi. Visit *www.diamondhead.org* for more information.

**Staver Locomotive Spring Steamup 2021 —** Staver Locomotive, Portland, Oregon. Visit *www.staverlocomotive.com* for latest information.

**Fourth Annual Gathering of North American Members of the Association of 16mm Narrow Gauge Modellers - 2021**. Venue will be in Northwestern Ohio. Visit *www.northamerican16mmmodellers.org* for registrations and venue information.

**National Summer Steamup, July 2021 -** Lodi Grape Festival and Events Center, Lodi, California. Visit *www.steam-events.org* for more information.

## Regular steamups

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

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

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

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


*The growing White River Productions family now includes*

NARROW GAUGE AND SHORT LINE GAZETTE

*Presenting accurate information for fine model building since 1975, the Gazette is your resource for narrow gauge layouts, projects, and plans.*

ONE YEAR, SIX ISSUES
$40.00 in U.S.
CANADA $45.00
INTERNATIONAL $55.00

**Subscribe today at ngslgazette.com**

WHITE RIVER PRODUCTIONS
Toll-free (877) 787-2467 • Overseas (660) 695-4433
P.O. Box 48, Bucklin, MO 64631 • info@WhiteRiverProductions.com
NGSLGazette

# GERMAN CLASS 45

MBV SCHUG
ACCUCRAFT EUROPE

The most powerful steam locomotives ever operated in Germany

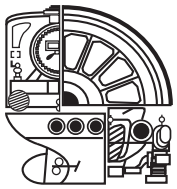
Some of the features:

Gauge One 3-Cyl. Live Steam,
Butane fired dual flue Copper Boiler,
fully working Walschaerts Valve Gear,
Axle- and hand operated feedwaterpump,
fully sprung chassis, length 802 mm, scale 1:32,
min. Radius 3 m, gauge 45 mm, limited to 50 units.

We have the last units in stock, please ask for price.
Worldwide Shipping from Germany with UPS.

Contact: MBV SCHUG Accucraft Europe
Neustrasse 18 D-54340 Detzem / Germany
Phone +49 6507 802326 Fax +49 6507-802327
e-Mail: info@accucraft.de www.accucraft.de



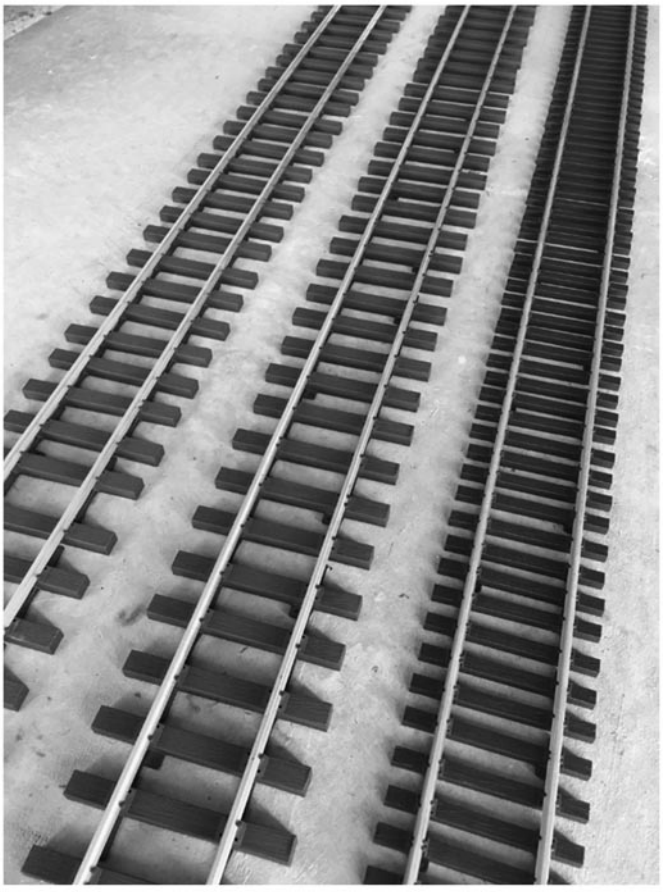


# WALSALL MODEL INDUSTRIES

Suppliers of wheel castings,
White metal fittings, laser cut frames,
Lost wax brass castings, Handrail knobs
Loco and wagon kits in brass, Cylinder
castings, Axles, Bushes, Crank pins,
Screw link couplings
Catalogue of castings and parts £2.20 plus p&p
Catalogue of Loco and wagons kits £1.20 plus p&p

**Unit 16/17 Ashmore industrial estate,**
**Short acre street, Walsall,**
**West midlands, WS2 8HW U.K.**
**Tel (+44) 01922 633718**
**website**
**www.walsallmodelindustries.co.uk**
**e-mail**
**info@walsallmodelindustries.co.uk**





LLAGAS CREEK
RAILWAYS
G Scale / Gauge 1 Track & Accessories
*Serving the hobby since 1987*

- World's most complete line of premier Code 215 and Code 250 track, turnouts, and accessories.
- Brass, Nickel Silver, and Aluminum rail available.
- 1:20.3 & 1:32 tie strips.
- The industry's most accurately detailed metal cast points and frogs.
- #4, #6, #8, and #10 turnouts with cast wear parts, no plastic.

**We also do custom/bespoke track work:**

- Custom hand-built curved and slip turnouts, crossovers, wyes, and crossings available.
- Have something unique in mind? We will make it!
- Custom track work services include full-size printable PDF blueprints made to ensure a proper fit on your layout.

**www.llagascreekrailways.com**
llagascreekrailways@gmail.com
(724) 986-5079
*Credit cards and PayPal accepted through our web store*
*Checks accepted with orders placed via phone or e-mail*

STEAM EVENTS LIMITED LIABILITY CORP.

The COVID19 pandemic forced us to cancel the 2020 National Summer Steamup, but your steam up planning team is getting ready for 2021 at our new home in Lodi, CA.

Please visit us at www.steam-events.org for more details.

Color Catalog $3.50

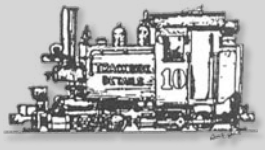
TRACKSIDE DETAILS

*now a product line of*

Valley Brass & Bronze

TD-250 Brake Fittings

TD-249 Elbows



Trackside Details
7070 N. Harrison Ave.
Pinedale, Calif. 93650
Phone: (559) 439-0419

www.tracksidedetails.com

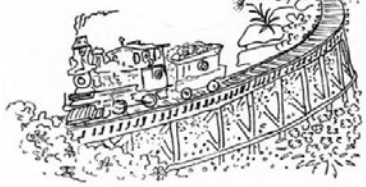
**Moving?**
**Or have a recent change of address?**

**Please make sure to let us know so we can ensure you get your *Steam in the Garden*.**
**Drop us a post card:**
**Steam in the Garden**
**Attn: Subscriptions**
**P.O. Box 335**
**Newark Valley, N.Y.**
**13811-0335**
**E-mail us at:**
**circ@steamup.com**
**or**
**Give us a call: (607) 642-8119**

www.
GardenLines
.net

Nancy Norris
creates gardens
for steam trains!

(925) 408-9402
nunorris@aol.com
Lic. #870086



Cedarleaf Custom
Railroad Decals

**Custom Decals Specifically Designed for Your Railroad**

Call or email
Stan Cedarleaf
(928) 778-3732
scedarleaf@aol.com
http://bit.ly/cedarleaf

**NOT ALL METAL WHEELS ARE CREATED EQUAL**℠

Gary Raymond Dual Ball Bearing Wheel Sets

**Upgrade to higher quality wheels!**
Easy installation – Reliable
on all large-scale track
**Ask your local dealer or call us direct**
PO Box 1722-S • 1000 Oaks, CA 91358
805-492-5858 • M-F, 9-5 P.S.T
**www.trainwheels.com or glraymond@earthlink.net**
**GARY RAYMOND**
Quality Large Scale Metal Wheelsets™

Remote Control Systems
2.4 Ghz RADIO CONTROL

**NEW FROM RCS**
**REAL USA 3 & 5 CHIME WHISTLES**

Easy Plug In installation. Uses any spare channel on any standard servo connection. Powered by the R/C system.

Ideal for RCS Ch # 5.
Use 8 ohm speaker.
Hear sound sample.
**A$ 49**
Low cost postage.

**Low cost Live Steam package deals.**
P.O. Box 578, Casino, NSW, 2470.
Tel 0429 029 083 Pay Pal available.
website: www.rcs-rc.com E-Mail: info@rcs-rc.com


**Your West Coast Aster Kit Builder**

Expert Aster kit assembly with experience in a wide range of discontinued and new kits. I can also install customized lighting and additional custom 3-D Printed details to make your Loco more historically accurate. Exclusive to The Zelatory. I offer sales and installation of the 'Scale Dynamo'. -Power your loco's lights with steam-

thezelatory@gmail.com

ONLY $19.00 Per Year

***Steam in the Garden Digital***

*Take Steam in the Garden* along with you in digital format with a *Digital Subscription*. You will get access to over 12 years of Steam in the Garden available to view online at *www.steamup.com* or download the issue in Portable Document Format (PDF) to your Computer or Tablet.


**Subscribe at**
***www.steamup.com***

**COMPLETE YOUR COLLECTION**


***Steam in the Garden*** **has a cache of magazines dating back to the 1990s. You can get bundled deals by calling (607) 642-8119 or visiting *www.steamup.com.***

## HARD TO FIND

small fasteners for the live steam hobbyist at reasonable prices.

Examples: Socket head cap screws, 4-40 x 3/4 alloy — $4.75/100, stainless — $6.95/100. Hex head machine screws, 2-56 x 3/8 stainless — $7.25/100. 2-56 x 1/2 brass — $5.75/100.

Sizes 0-80 thru 10-32 in brass, alloy, aluminum & stainless. Call, fax or write for FREE CATALOG.

### MICRO FASTENERS

13 South Bank St.
Easton, PA 18042

Phone (800) 892-6917
FAX (610) 438-6179
email: info@microfasteners.com

visit our web site: http://microfasteners.com



## Spring Cleaning!


**Buy six back issues* of *Steam in the Garden***
**At a blooming low price!**
***CALL(607) 642-8119***
***AND ASK MARIE FOR THE SIX PACK OF ISSUES FOR $18, SHIPPING INCLUDED***
**Offer applies to issues #150 and older.*




We are looking forward to seeing everyone in April 2021!

Registration, event info and more on our website!

www.staverlocomotive.com



## THE GAUGE ONE MODEL RAILWAY ASSOCIATION

Just imagine the thrill, spectacle and sound of a real live steam express locomotive or diesel running through your garden, or perhaps a more sedate freight train hauled by a modest switcher. Whatever your tastes, G1MRA–the oldest established large-scale and garden railway association can help you realize that dream. Benefits include our renowned quarterly Newsletter & Journal, a wide range of construction book publications, friendly local groups and trade supplier lists. G1MRA layouts are regularly featured at major exhibitions worldwide - check our website events list for details.

*For joining details please visit our website, or write to:*

**USA**
Ernie Noa
4009 Freedom Blvd
Champaign, IL 61822
217 649 6605
ernienoa3@gmail.com

**CANADA**
David Morgan-Kirby
10 Porter St, Stittsville
Ontario, K2S1P8
613 836 6455
gaugeonelines@yahoo.com

www.g1mra.com

## CONTRIBUTOR BIOS

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

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

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

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

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

**Jeff Young -** Jeff Young is a retired professional engineer, having worked in the rail transportation industry in academia, government and private sector consulting. As a life-long model railway enthusiast, he has been involved in small scale live steam since 1980. Jeff's back yard line, the Algonquin Light Railway, has been in operation for thirty years. As well as models, he enjoys running full size narrow gauge locomotives whenever possible.

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

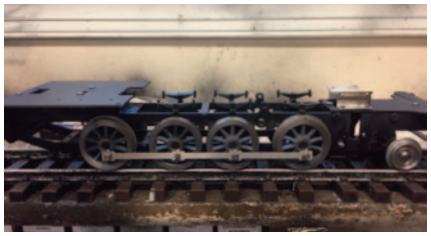
We need Locomotive Reviews, Tips & Hints, Steamup Reports, etcetera. All contributors are compensated for their submissions. Submitting is easy. Just e-mail your idea to sitgeditor@gmail.com and we'll work with you to bring your article to our pages. Visit www.steamup.com to view our Contributor Guidelines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

## Advertiser Index

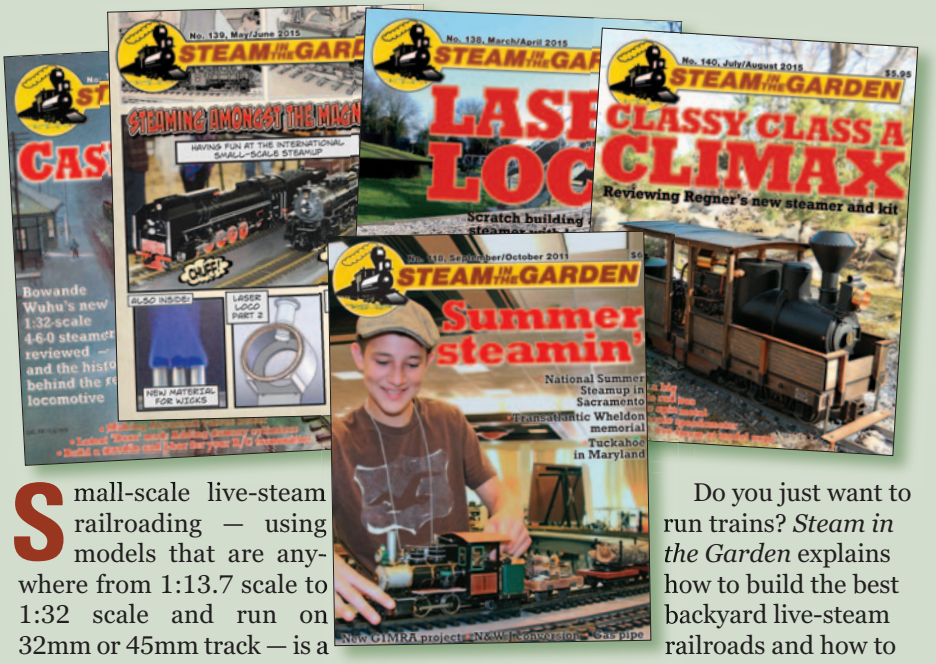


**Coming Soon!**
**Issue #172**
**March/April 2021**

**Part 2**
**Freelance Consolidation**
**Build Series**
**by Les Knoll**



# Steam ... it's the real thing!




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

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

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

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

Want to make improvements on your locomotive? *Steam in the Garden* has dozens of articles every year that show you in detail how to add features to your small-scale loco or make your rolling stock run better.

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

*Steam in the Garden* is sticking to its 20-year history of giving hobbyists the best information, illustrated profusely, in an easy-to-read format. Fill out the form below and subscribe today to *Steam in the Garden*.

☐ **Yes**, I want to subscribe to Steam in the Garden magazine. Please rush the next six issues of the bimonthly magazine to the address below. I've enclosed $35 for a regular U.S. subscription, $43 for a first-class mail U.S. subscription, $US42 Canada/Mexico, $US72 overseas. Mail to: Steam in the Garden, PO Box 335, Newark Valley, N.Y. 13811-0335.

**Name** _____

**Address** _____

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

**Phone** _____ **Email** _____

**MC/Visa/Discover** _____

**Expiration** _____ **Security code** _____

Silver State Trains

www.silverstatetrains.com

702-361-2295

702-595-5318 cell

Blow Out SALE

AMS 1:20.3 Freight Cars


PRE-ORDER ONLY
NO DEPOSIT REQUIRED

Accucraft is proud to officially announce the planned mid-2020 release of the D&RGW Class C-18 2-8-0 Consolidation Type in live steam butane fired. Of the several C-18s made by Baldwin, the #315 and #318 are only ones to survive to today thanks for restoration efforts. Both were originally built for the Florence & Cripple Creek Railroad by Baldwin Locomotive Works.

**The production batch will be heavily dependent on pre-orders and expressions of interest**

Goodall Valve
&
Water Bottle

Ruby Kits
now in stock

7/8 Forneys are Arriving Soon!

Wiscasset, Waterville and Farmington #9

SANDY RIVER & RANGELEY LAKES #6

Summerlands
Chuffers

D&RGW C-25 Butane Fired
AL87-121B #375 BLACK w/ FLYING RIO GRANDE
AL87-122B #375 GREEN BOILER w/ MOFFAT LOGO

ONLY
$45.00
Per Year

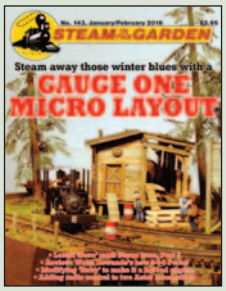
# Steam in the Garden Print & Digital Combination Special

Print Subscription for at home - Digital for on the road or in the workshop! PLUS – Access to 30 years of Steam in the Garden available to view online or download Portable Document Format (PDF) to your Computer or Tablet.


**Subscribe at**
***www.steamup.com***

# Complete your collection!

## Don't miss out — back issues for only $3



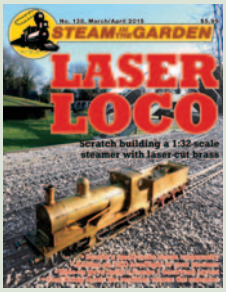

**Vol. 26, No. 1; Issue 143; Jan./Feb. 2016**
Micro layout: Building an indoor Gauge One track • Review of Wuhu Bowande Porter • Hot-rod 'Ruby': Hopping up a 1:20.3-scale engine • Rolex Asters: Adding radio control • Learning to model in tinplate with a 'Dora' modification, Part III • Latest waybill: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


**Vol. 25, No. 6; Issue 142; Nov/Dec 2015**
In memoriam: Andre Anderson, Wuhu G5: Locomotive review — 1:32-scale, 4-6-0 , Topaz: Alchemy, building an Accucraft 'Ruby' kit, Tram: Learn to model in tinplate, Sacramento stationaries: NSS 2015 highlights miniature machinery. WWI car: Creating a 7/8ths-scale Fort Benning railroad observation car.


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


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


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




**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..

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 143 | 142 | 141 | 140 | 139 | 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 | 54 | 53 | 52 | 51 | 50 | 49 | 48 |
| 47 | 46 | 45 | 44 | 43 | 41 | 40 | 39 | 38 | 37 | 32 | 36 |
| 33 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | | | | |

Number of issues circled _____ x $3 ..... $_____

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.**

# *THE FINEST IN GAUGE ONE LIVE STEAM*


ASTER HOBBY - LNER THOMPSON CLASS B1

Alcohol Fired, 4 Liveries, Kits and Ready To Run


ASTER HOBBY - USRA LIGHT & HEAVY MIKADO

Alcohol Fired, 8 Roadnames, Kits and Ready To Run


ACCUCRAFT - ADAMS RADIAL TANK 4-4-2T

Butane Fired, 5 Liveries, Kits and Ready To Run

ASTER HOBBY

ACCUCRAFT TRAINS