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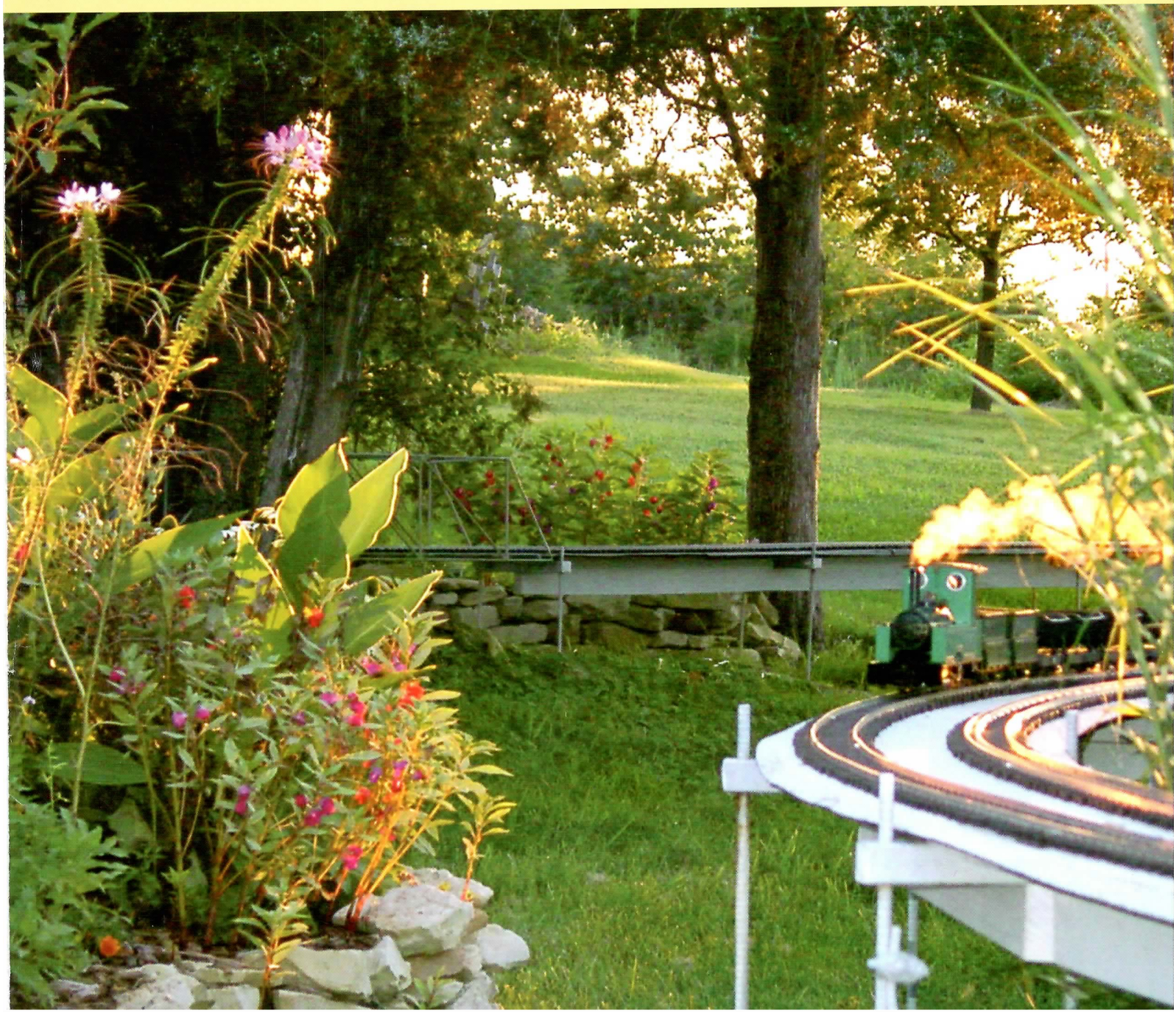

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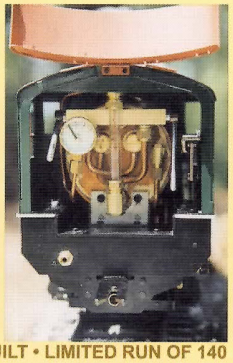

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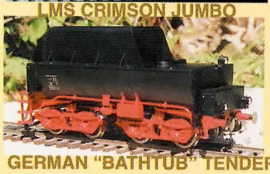

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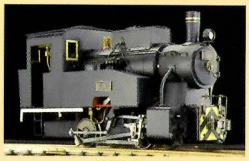

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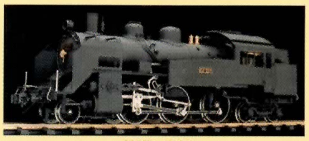

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STEAM IN THE GARDEN

with Steam on the Pond

Vol. 12, Nº 6

Issue Nº 66

Articles

Departments

FRONT COVER:

Tranquility! The setting summer sun backlights the steam plume as AILEEN rounds a curve on Larry Herget's elevated line in Missouri. The loco was built by Steamlines in England, which is no longer in business. It was one of the first (to our knowledge) commercially available 7/8" scale steam locos.

photo by Larry Herget

Publisher/Editor
Ron Brown

Faithful Assistant
Marie Brown

CAD & Other Drawings in This Issue

• Les Knoll • Peter Watson • Larry Bangham •

Regular Contributors

Larry Bangham ..... California
Keith Bucklitch ..... England
Jim Crabb ..... Texas
Joe Lecesse ..... Massachussetts
Kevin O'Connor ..... California
Ken Parkinson ..... Florida
John Thomson ..... Texas
Chuck Walters ..... New York

Steam in the Garden (USPS 011-885, ISSN 1078-859x) is published bimonthly for $30.00 ($35.00 Canadian, $38.00 overseas) per year (6 issues) by Steam in the Garden Inc., PO Box 335, 6629 SR 38, Newark Valley NY 13811. New subscriptions please allow 6 - 8 weeks for delivery (overseas via surface mail may take longer). Direct correspondence to PO Box 335, Newark Valley NY 13811. Periodicals postage paid at Newark Valley, NY and additional mailing offices.

POSTMASTER: send form 3579 to Steam in the Garden Inc., P0 Box 335, Newark Valley, NY 13811. Printed in USA.

USA, Canadian and overseas subscriptions may be sent to **Steam in the Garden Inc., PO Box 335, Newark Valley NY 13811.** Phone, fax and e-mail subscriptions gladly accepted. We accept VISA, Discover and MasterCard.

In the U.K., contact Brandbright Ltd., The Old School, Cromer Road, Bodham, Near Holt, Norfolk NR25 6QG — phone 01263 588 755 FAX 01263 588 424

In Australia, contact RCS, PO Box 1118, Bayswater, Victoria 3153 AUSTRALIA — phone/fax (03) 97 62 77 85

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Questions or comments? Phone us (Mon. - Thurs. - before 8:00 p.m. Eastern time, please) at 607-642-8119 ● 24-hr FAX 253-323-2125 ● e-mail address: docsteam@steaminthegarden.com

Check out ***Steam in the Garden Online***, located at: <http://www.steamup.com>.

2002-2003 CALENDAR OF EVENTS

August 30, 31 & September 1, 2002 - Pennsylvania Live Steamers Labor Day Weekend Steamup. Rte. 29, 1 mile north of Rte. 113, Rahns, PA. Permanent Gauge 1 rack and Gauge 0/Gauge 1 portable tracks in operation. Night running with lights. Food available on site with lodging nearby. For information and directions contact Harry Quirk, PO box 215, Springtown PA 18081 - phone 610-346-8073 - e-mail mikemoore@comcast.net.

September 1, 2002 - Valley Forge Model Ship Society's Steamboats Only Meet at Gotwall's Pond, Kimberton Pennsylvania, off PA Rt. 113 in Pennsylvania. Ground-based R/C frequencies required. Starting time 9:30 a.m. If you're coming to the PLS meet, bring a steamboat and join us...we're just 12 miles from the PLS site. For more info, contact Ernest Morris, 929 Spring City Rd., Phoenixville PA 19460 - phone: 610-948-8107.

October 12 & 13, 2002 - Reading Public Museum, 500 Museum Rd., Reading PA. The Gauge One contingent of the Pennsylvania Live Steamers will be setting up Mike Moore's portable Gauge 0/1 track. This event is part of the museum's "TRAINS!" exhibition, August 4, 2002 - April 13, 2003. Information: Harry Quirk, Box 215, Springtown, PA 18081, (610)346-8073. Email: mikemoore@comcast.net

November 9 & 10, 2002 - Fall Meet, Manatee Central RR & Family Lines. Parrish, Florida. For more info, see listing for July meet on this calendar.

January 1, 2003 - New Years Day Run, Manatee Central RR & Family Lines. Parrish, Florida. For more info, see listing for July meet on this calendar.

June 21-25, 2003 - LGBMRRC National BTO Convention, King of Prussia, PA, a suburb of Philadelphia, near historic Valley Forge. There will be numerous excursions including a special visit to the Pennsylvania Live Steamers, a trip to Steamtown National Park in Scranton, and a full day in Strasburg to visit the Strasburg railroad, the TCA museum, the Pennsylvania Railroad Museum, and more. In order to attend the BTO convention you must be a member of the LGBMRRC. Dues are $25 per year. You can download a member application from the website at <http://www.LGBMRRC.com/>.

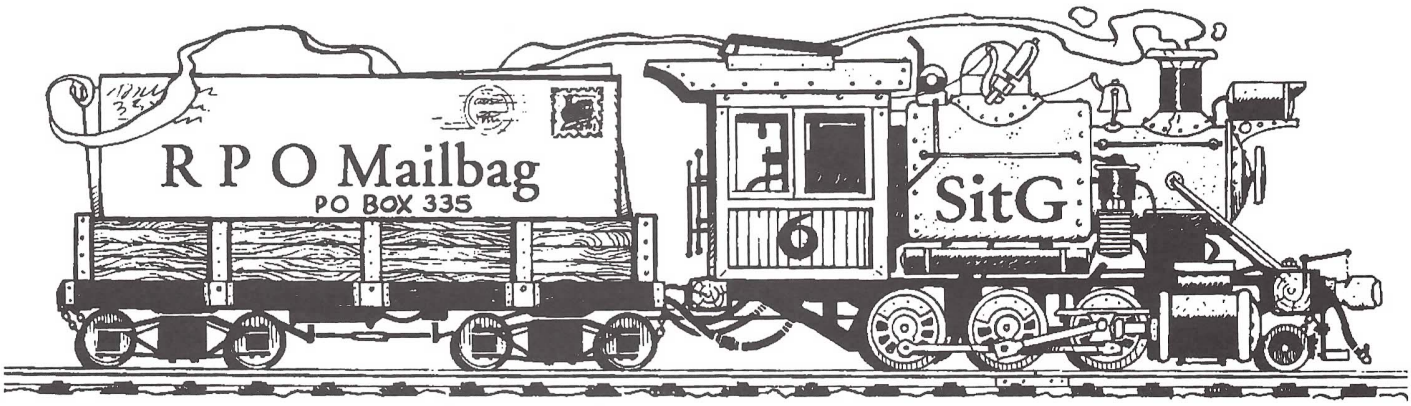
Because of publication lead time, please send info for Calendar of Events well in advance. Include name of host and location of event, with address and/or phone number to contact for complete information. Some basic info about the site is also useful (i.e., ground level or elevated, minimum curve radius, ruling grade, etc.)

HELP WANTED!

We're running low on articles, steamup reports, loco and product reviews, photos, etc. So...we're turning to our readers for assistance. You have always been generous in your response to our requests for publishable materials with a focus on gauge 1 live steamers.

This is YOUR magazine, and YOUR forum for exchange of ideas and information, so send 'em in.

Got questions? The combined experience of our readers is the best in the world, so go ahead and ask.



Letters from readers are welcomed and encouraged. Offer advice, encouragement, suggestions or constructive criticism. Tell us about your current project (and don't forget the photos!) or just share live steam experiences. But please keep your letters to a reasonable length so everyone has a chance to use this forum. Letters may be edited for length or clarity. Send your letters & photos to: SitG, Dept. RPO, P.O. Box 335, Newark Valley, NY 13811, USA.

* * * * * *

Mexico
via e-mail

Dear Ron,

About the simple circuit for an LED indicator to be inserted in the on/off switch circuit. No drawing is necessary it's so simple. Connect the longer lead of an LED to the positive current and the shorter lead of the LED to the negative side. A 300 OHM 1/4 WATT RESISTOR HAS TO BE INSERTED IN SERIES IN ONE SIDE OF THE CIRCUIT. The formula for the resistor size is V ÷ .02 . The 300 ohm value is based on a 6 VDC supply. The resistor wattage size can be very low and isn't important.

The LED is to indicate when the On/Off switch is in the 'On' position. It has to be tapped parallel into the 2 conductor cable that feeds the 6 VDC into the receiver. Polarity is very important

Many times the On/Off switch is not positioned on locos or tenders in a place that is easy to get to; as in Peter Thornton's article in the #64 SitG. He shows installing the On/Off switch with its controlling "finger" protruding downward out on the bottom of the tender's floor. To me that's not a practical place for this control because of its access inconvenience and because you have to turn the tender over to really know the position of the switch. If the tender is ever going to be used for water storage, the battery pack and receiver will have to be isolated from the water.

I arranged my #268's tender with a water proof brass partition behind the butane tank leaving enough space to place the receiver and battery pack in front of the factory soldered in wall that encloses the tender's rear area. This is where the round water tank and the manhole cover are mounted on top of. The mentioned switch was mounted horizontally in the rear vertical wall of the manhole cover just below its hinged cover. Even with the switch's On/Off indication plate in place I never remember what position the switch is in and it is practically unreadable because of where it is mounted. The LED installation solves this problem.

I hope this will aid some of our bunch of model RR nuts. I am installing LEDs on all my R/C controlled engines.

Arthur Cohen

* * * * * *

Tennessee
via e-mail

Dear Ron,

I was impressed by the work described in Les Knoll's first article on his Shay project. It's encouraging to see someone go from never having done such a thing to developing from scratch and producing a fairly complex and convincing locomotive project. I'd like to see more of that in this country.

I would differ with Les on one point, which is that, mechanical issues aside, in many cases a model built to exact scale rarely appears to faithfully represent the proportions of the prototype to the human eye and some subtle re-proportioning is usually needed to make it look 'right.'

The best models are the ones where the builders understand this and know just where to make the adjustments, so proportion can and does play an important role in producing a fine 'scale' model.

I also think that the readers, myself included, would be very interested to know what tools and machines Les has used in his work, if he hasn't already planned to include that in upcoming episodes.

Regards,
Harry Wade

* * * * * *

Southern California
via e-mail

Hi Ron,

I found the Shay construction article by Les Knoll both inspired and inspiring. His analogy between creative modeling and the intricacies of musical composition and improvisation rings with a familiar clarity.

I have been building a Southern Pacific Vanderbilt tender to accompany my S.P. altered Mike and have had no luck finding the right trucks. Les's creative attack on solving his truck problems in-

spired me to bite the bullet....really he shamed me into it. What the hell, my trucks will just go along for the ride, his have to pull the train.

Les, you are an artist, but if I may offer a critical observation, which may bring you a little closer to a state of perfection; When depicting circular shapes in isometric or perspective with but one exception, the major axis of the ellipse is ALWAYS normal to the axial center line. The exception is when the circular feature is not normal.

Keep up the good work,
Larry Bangham

* * * * * *

Milwaukee, Wisconsin
via e-mail

Dear Sir:

Just returned from the Garden Railway Convention in Cincinatti. Had a great time visiting all the layouts and meeting with fellow train enthusiasts. It was disappointing that none of the clinics pertained to steam engines, nor did I see any steam layouts. Those in charge of the convention were able to set up a steam track by the outdoor pool, and I enjoyed talking with Dave, Andy, and Tom while they ran their engines. They were a pleasure to talk to and convinced me that I need to get another steam engine. My Frank S is not enough. I'm hoping that some day I will get a chance to drive down to Diamondhead. Maybe in 2004.

Dave Hjortnaes

* * * * * *

Quebec, Canada
via e-mail

Hi!

Got a question: Because steam oil is an hazardous product, it is prohibited from exportation from the US to Canada. So where can I find a good source of steam oil in Canada, specially in the Montreal area (or by mail order)?

Thank you,

Yvan-Martin Levesque

(How about it, Canadian readers? Can you help Yvan-Martin? - ed.)

* * * * * *

Seabrook, Texas
via e-mail

Dear Ron & Marie --

Just want to let you know that things haven't cooled off in Texas. We still get together almost once a month to run trains, admire new acquisitions, and mentor each other in the art of live steam.

Our latest 'run date' was June 29 at the home of Marvin and Lemma Nite in San Marcos. They are always wonderful hosts and Marvin keeps four loops in good repair -- two tracks with each one having a double loop. We had about 16-18 folks running trains and a few more 'lookers.' There were even a couple of new folks whose normal passion is sparkers. They were really impressed that the sounds and smells were real and not artificial.

Something a little different this time was three coal fired engines running at the same time. (Next time there will be four because Caleb Roberts will have his new John Shawe converted Mikado.) Of course Bill Courtright had his Sandy River № 24 in perfect form, and the other two were John Thomson-built 'Donkeys.'

Those simple, entry level coal fired engines are a delight to run *(see review in this issue)*.

It is just amazing that a group that started a little over four years ago with 6 people now can claim 40+ around the state. We have had the largest representation at Diamondhead the past three years and we just keep spreading the 'gospel.'

This is an open invitation to anybody visiting Texas to give us a call. Except for avoiding the heat in July and August there is usually something going on every month. And, we are quick to make a few phone calls for an impromptu evening gathering.

Your faithful scribe --

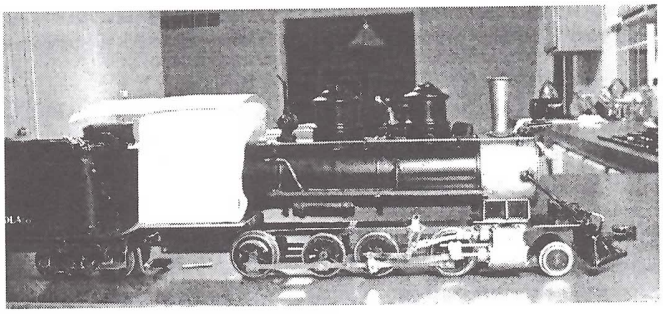
Jim Crabb
Seabrook, Texas
281-474-5654

* * * * * *

via e-mail

Ron:

This is my current project, building a C-16 styled 2-8-0 Consolidation with a Roundhouse lower works. I have used a number of parts and assemblies from the Pearse Nevada that I previously converted to a 2-8-0. The boiler, two of the driver sets, and pilot were originally supplied by Pearse, but that's about it.



The tender is a scratchbuild from the 2-6-0 to 2-8-0 conversion. The lower works frame is my own design to accommodate the Roundhouse cylinders and valve gear. The valve gear has been modified to drive the second driver as was Rio Grande practice.

The return rod and return cranks are of my own making because of changes in driver spacing from that specified by Roundhouse and the fact that I am using Pearse specified (actually Walsall manufactured) drivers set up for 8.5mm crank throw as opposed to Roundhouse with a 5/16" throw.

It all comes together, though, and so far the chassis runs like a swiss watch. Will keep you informed as the project progresses.

Les Knoll

(Les has generously agreed to write about this new project for our readers once he has it completed and running - ed.)

via e-mail
Montreal, Canada

Sorry, I quit!!

I read about live steam for the last 2 years. I'm 29. So steam locomotive are a complete mystery for me! I never saw a real steam locomotive in my life, until the first week of July. For my birthday, my girlfriend Sandra brought me to the Train Museum in Delson (Southshore of Montreal) where I rode on a working replica of the John Molson, a steam loco running in Canada during the 1840's.

Like many of us, I have read questions (in forum and magazine such as SitG) from other newbies: My loco is not running well. What can I do? Where can I find a replacement for my valve?

As every newcomer, those questions didn't give me confidence in my own skill for running a live steamer!!

July 6. The day of my birthday, I took a serious decision : it was the time to jump in! I called a couple of stores, asking them for availability and prices (I saw all their ads in SitG). I chose the Ida, specially for the pressure gauge. California & Oregon Coast Rwy, the store I chose, sent me my loco via air mail. Man, USPS and Canada Post can be very slow some time!!!

Wednesday, July 17, a notice in the mail : a parcel was waiting for me at the post office. There was no doubt in my mind!! I worked at 2 pm that day. So I went to the post office en route to the job. I'm working in a very big newsroom (twice CNN at Atlanta. No joke!) for the CBC. Everybody was looking around when I opened my package, right in the middle of the place, where all the reporters and TV sets are located. There it was : a Ruby Ida. Everybody was saying "Wow! This is nice! Are you sure this thing runs on gas for real?" - "800 $ (CND) for that!! You can get 2 Playstations for less!"! I was too high to answer to any interrogation.

I went back to my home at 1 am. My girlfriend (who was working on the same shift as me) told me gently "Don't go to sleep too late."

I went to the basement, where my distilled water, 3-in-1 oil and butane can was waiting since the week before. I tried to resist. I swear I tried. But I'm only human. So I fill the loco with water, oil, steam oil. I forgot every advices I read on SitG or forum before. I lit up a match. Then a second, then..... After the fifth match, there it was. My own live steam, boiling water.

After the security valve began to exhaust some steam, I pushed it on my benchwork. She showed signs of life. I sat the loco on rollers and I opened the throttle. Magic. SHE IS ALIVE!!

I went to sleep at 2 am. I can't remember if I slept, but I get up at 7 am, one hour before my 2 years-old daughter (this is really early!). I brought everything outside. Using my two SD45 electric locos, I removed every car on my layout, parking them on a siding far from the main, just in case Ida decided to weather them.

I ran the loco forward first. The first trip was a complete success. My decision was obvious. I quit!! I quit plastic trains! The real thing is there. Hourra pour la vapeur vive! (hurray for the live steam!).

After the beginner's luck, came the experience. I made the second run in reverse, to break-in the loco. The gas valve was too open, the fire too hot, the pressure was high and the throttle too sensitive. Ruby derailed at full speed in the ballast. The side of the cab was scratched. Not badly scratched, but scratched. Instead of being sad, I was proud! This was scars. Proof of experience. Proof of the past. The scars was there to stay!

The next runs were without any problem at all. I wrote this text immediatly after this enjoyable experience. No doubt in my mind - I want to be a live steamer! You can see movies and pictures of this memorable trip on my website, in the album section.

www.trainweb.org/montreal/g-scale

Yvan-Martin Levesque

* * * * * *

Duluth, Georgia
via e-mail

Dear Ron,

I would like to thank Hartland Locomotove Works for sponsoring the live steam track at the 18th National Garden Railway Convention. I think it's great that a comppany that does not even make live steam engines would sponsor an event like this.

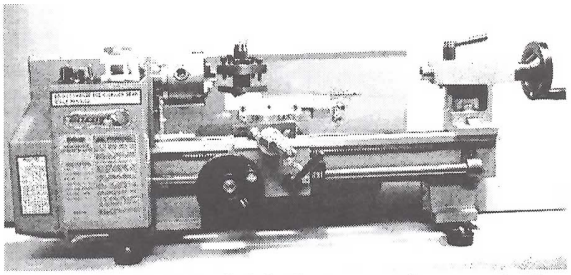
This was my first time running on a milti user track, so after a few pointers from Al Sadler of the Greater Cincinnati Garden Railway Society, I was soon off and running.

The fun and friendship that I experienced at the convention has really got me looking forward to Diamondhead in 2003. I am new to live steam and I own an Accucraft Ida, which I am very pleased with. I have only had it for eight months and I enjoy running it on my outdoor layout. I have started making some cosmetic changes to it so it will have its own distinct look. I don't know where this will take me, but I will have to admit that I have found myself looking for my next engine.

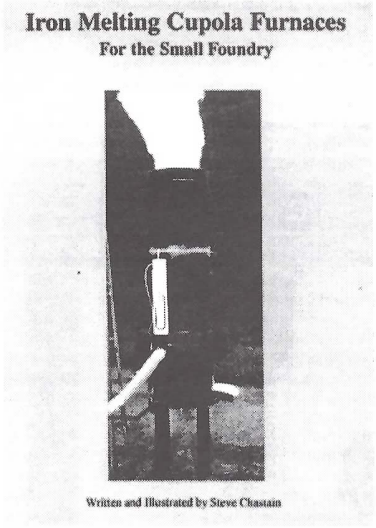
Joe Fotschky

WHAT'S NEW?

Hey, all you chip makers, home machinists and wannabe's out there! We found a web site that has much to offer all of us who enjoy making our own locomotives and/or steam engines...or at least some of the bits and pieces. Check out **http://www.mini-lathe.com/** The creator and webmaster of the site, Frank J. Hoose, Jr., has done a fine job of bringing useful and essential information for hobby machinists, with the primary focus on those smaller (and very popular) 7x10 and 7x12 mini lathes. Frank has reviewed 3 of the most popular mini-lathes, and he doesn't pull any punches. He presents them just as they come out of the box, with warts and all. In addition, he has numerous suggestions for improving the appearance, performance and function of these affordable machines. His site includes links to a wealth of informative web sites and discussion groups on mini-lathes and more for the home workshop enthusiast. For the novice, he offers instruction on mastering the mini-lathe through a Premium (fee) membership. We spent a couple of very pleasant hours perusing this web site and following some of the links, and we recommend it to our readers without reservation. That's **www.mini-lathe.com/**



A Grizzly 7x12 mini-lathe, one of several discussed on the web site.



And while we're on the subject of the home shop craftsman.....how about making your own castings? If you want to produce iron or bronze castings, the cupola is the fastest, cheapest furnace to use. This book tells you exactly how to build one. ***Iron Melting Cupola Furnaces For the Small Foundry***, written and illustrated by Steve Chastain, does the job with photos, drawings and a wealth of experience by the author. $19.95 + $1.75 postage (if ordered direct). Available from bookstores, or order direct from: Stephen D. Chastain, 2925 Mandarin Meadows, Jacksonville FL 32223, or e-mail Stevechastain@hotmail.com.

This just in from a Roundhouse dealer..... "After holding prices for three years there will be an increase effective September 1 on Roundhouse locomotives, primarily affecting the Darjeeling (increase of about $200) and the Forney. All orders placed with dealers before September 1st will be honored at quoted prices." Sounds like those of you who plan to purchase a Roundhouse loco in the near future might be well advised to make your move now. Contact your favorite Roundhouse dealer (check the list in the Roundhouse ad in this issue) for more information and to place your order.

News Flash! Building a new track this summer - or adding more mainline, passing sidings, steaming or storage to your existing track? **Sunset Valley Railroad** announces that they now have significant stocks of most turnouts, and delivery time for non-stock items is maximally 2-3 weeks. Check the SVRR ad in this issue for contact information.

The Steaming Up Process and the Steamer's Toolbox

Article, Illustrations and Photos by Chuck Walters

Many small-scale live steam enthusiasts take the steam up process for granted, but that's because they have been doing it for so long it becomes second nature. To the newly initiated person in the hobby, this process is not so obvious. However, a guiding hand and a bit of practice can make all the difference. This month's installment for the beginning live steamer will take a look at the steaming up process and the tools that are needed to successfully enjoy the wonderful hobby of small-scale live steaming.

The Steaming Up Process

Before you can begin steaming your new engine, there are some essential items that you will need to gather together. Here is a list and a description of each of those items:

Distilled water: This can be obtained from any grocery store in one-gallon size containers for less than a dollar. No other type of water should be used! Not de-ionized, not tap water, and not mineral water. These other types of water can cause damage to the inside of the boiler by building up unwanted deposits or breaking down the solder joints. Some folks have used water from a dehumidifier and have had good luck for years, but for the small price of the gallon jugs at the market, better to be safe than sorry.

Steam oil: Obtained from any live steam dealer (see the various ads in this issue). This oil is used to internally lubricate the moving parts such as the steam cylinders, pistons and valves. Use only steam oil in the engine's lubricator.

Lubricating oil: This is the oil used for lubricating all of the external moving parts of the engine. This oil should be able to withstand high temperatures due to friction and not sling off the moving parts easily. Not every dealer will carry lubricating oil, but it is not very hard to find locally. The oil I use and have had great success with is the 3-in-1™ oil in the blue can.

Figure 1 - The Essential Tools

This product is an electric motor lubricant and works well as a lubricant for our engines.

Fuel: You will need Butane gas (or a mixture of Butane/Propane if your manufacturer's directions indicate that it is okay to use this type of mixture) or Alcohol or Meths (mineral spirits) if your engine is an alcohol burner. As stated in last issue's article on choosing an entry-level engine, you will also need a butane adapter to attach to the canister for transfer into the engine's fuel tank.

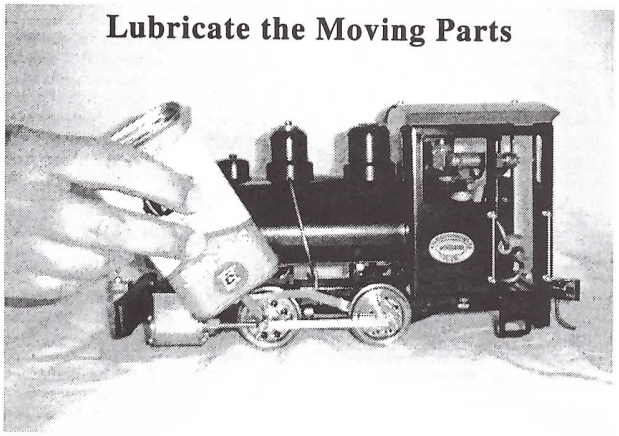
Syringes: These come with most of the engines you buy. Generally they are 50 to 60 mL in size and are used to transfer the distilled water from the gallon jug to the boiler. A small syringe can be used for evacuating the water that collects in the bottom of the steam lubricator if it does not have a drain.

A lighter or matches: For igniting the fuel.

Gloves, an old towel and rags: The rags will aid in cleaning up any oil or water spills and the gloves will help if you have to handle the hot engine. The old

towel will give you a place to lay your engine on its side while you lubricate the underside. (Please don't use your wife's good guest towels, as I do not want the scathing e-mail messages threatening my life after you mess it up with grime and oil.)

With everything at hand you are ready to steam your engine for the first time. This process can be somewhat ritualistic. I always stand in awe of the live steam model I am about to bring to life. While small in size, these engines are powerful and if handled foolishly can be dangerous. So please, use your head and be careful. Never take anything for granted! But please, do have fun!



- **Lubricate the engine.** Lay your towel out on a table near the track. Place your engine on its side on the towel. For this step you will use the lubricating oil (3-in-1™ or similar). The oil can be applied directly from the can, but use it sparingly. One drop in each area will be more than sufficient. Be sure to lube all the points that move on the running gear, the wheels, the piston slides and underneath the engine.

- **Fill the boiler.** Turn the engine upright remove the cap on the boiler and fill the boiler with distilled water. Sometimes this cap is also the safety valve. If your engine uses this type of duel purpose cap, please be careful not to damage the safety valve/filler cap in any way. Place it in a safe place while filling the boiler. Use your large syringe and extract the water from the gallon jug and fill the boiler to the top so that it either overflows or just starts to. Discharge any extra water that may still be in the syringe so that it is empty. (Don't discharge the extra water onto your significant other, however...not if you expect dinner that evening. I was so hungry when I went to bed that night.). Now place the syringe back into the boiler and draw off between 25 and 30 mL. This is done so that there is room at the top of the boiler for steam to form (see Fig. 2). You will have to find that fine line of exactly how much to withdraw by experimentation, as every engine is different. Replace the safety/filler cap finger tight.

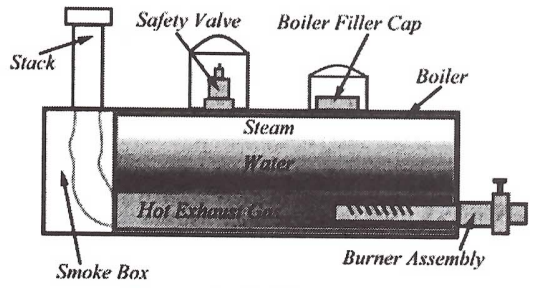


Figure 2 - Inside a boiler

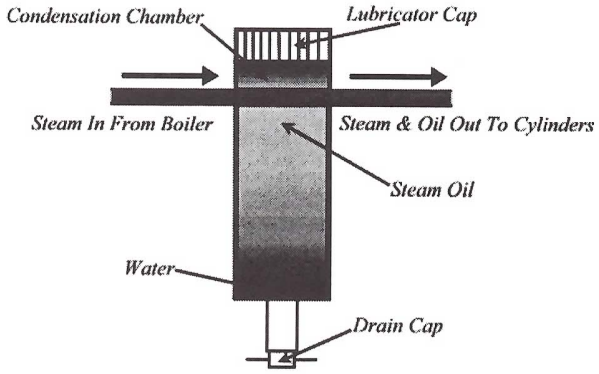


Figure 3 - Displacement Lubricator

- **Fill the lubricator.** Next you will fill the lubricator with steam oil. As mentioned in last issue's article, steam oil is a special blend of oil used for internal lubrication of the pistons, piston valves and steam cylinders. There are several types of steam lubricators that hold the steam oil and disperse it within the engine. Dead leg and displacement lubricators are two types used on our small steamers. Most engines have displacement type lubricators and we will concentrate on this type in the description below. If you follow these steps, you can't go wrong.

What to do:

- Unscrew the cap
- You will notice a pipe that runs through the lubricator (see Fig. 3)
- Fill the lubricator up to the bottom of this pipe
- Replace the cap (finger tight only)

How it works:

As steam passes through the steam pipe, some escapes into the lubricator cylinder through the small hole in the pipe, cools and condenses. Since water is heavier than oil, it falls to the bottom of the lubricator and the oil rises. Small amounts of oil then enter the hole in the steam pipe and are carried to the cylinders by the steam flowing in the pipe. So, if you do not fill the lubricator up to the level of the steam pipe (or neglect to fill it at all), there will be a period of time when NO steam oil is flowing to the cylinders and this could damage the cylinders.

Periodically, empty the steam oil lubricator in one of two ways. If you have a drain screw on the bottom of the lubricator, open it up and crack the top screw (filler plug) in the lubricator to release the vacuum. When the water is all drained out, oil should start to come out of the drain. Close the drain and refill the lubricator as before. If you do not have a drain, use a small syringe to suck the water from the bottom of the cylinder. Once you see oil in the syringe, stop removing anything else. Remove the syringe, refill the lubricator as before and cap it up.

- **Lighting the engine.** Now you are ready to light this bad boy up. Light up your favorite fire stick, (either a butane charcoal cooker lighter or a handy wooden match), crack open the butane gas regulator valve and apply the flame to the stack or inside the smoke box to ignite the burner. An audible pop will be heard and the flame should jump back through the flue to the burner. If it does not, and the flame stays in the smoke box or the stack, turn off the gas, wait a few seconds and start again. Adjust the gas regulator until you get a nice steady, consistent sound from the burner. The higher you adjust the gas, the faster you heat the water. But if you adjust it too high, you will force liquid butane into the flue and possibly force the flame out into the smoke box. Prolonged fire in the smoke box can cause damage to the engine and paint job, not to mention your ego.

- **Raising steam.** Now you get to play the waiting game. Most engines will reach working pressure (between 40 and 55 pounds per square inch) within 8 minutes. While this is happening, you can inspect the track for any debris, have a soda (or your favorite beverage) or talk to your friends, but do keep an eye on the engine for anything that may need attention. Also, if you have radio control, make sure it is turned on and the steam regulator servo is in the closed position. Let the engine sit and build steam until the safety lifts, then crack the steam regulator slightly and allow steam to flow into the cylinders. Some engineers like to crack the steam regulator and allow some steam into the cylinders to warm them. Others will open the steam regulator a crack and move the reversing gear into reverse and then back into forward to help warm and clean condensed water from the cylinders. Both techniques work well. The engine is now ready to head out on the mainline. Turn the gas regulator down just enough to maintain good working pressure in the boiler. Again, you will learn what is the best setting for your engine as time goes by. Crack the steam regulator, engage the reversing gear and let the engine begin to move on its own. Once the engine is moving, increase the steam regulator and watch your beauty move out onto the main and enjoy the experience.

- **Advanced Techniques.** There are many advanced techniques you can do with your engine to almost keep it in steam and running indefinitely, such as water top-up valves which allow you to add water to the boiler under pressure. But for now, be content with 20 to 30 minute long runs. Learn the characteristics of your engine and enjoy the hobby.

- **Blow down.** When the engine has completed its run, it is time to take care of a few miscellaneous maintenance duties. First, be careful handling the engine, it will be **VERY HOT.** Use gloves or a rag to turn any controls or handle the engine. The pressure should be relieved from the boiler. This can be done in a few ways. Before you attempt any of the techniques listed below, run the engine until all of the steam is depleted. This will help reduce the pressure in the boiler.

  ❋ Using needle nose piers, you can lift the stem on top of the safety valve. This opens the valve and allows the steam pressure to decrease.

  ❋ Using gloves, open the water filler cap very slowly. As soon as steam is seen, stop opening the cap and let it bleed.

  ❋ Open the drain on the steam oil lubricator. The pressure will force the water that has collected in the bottom of the lubricator out with the steam.

  ❋ If your engine has a blow down valve, open up this valve to release the pressure. However, many small entry-level engines do not have this type of valve.

- **Clean up.** When you are done running for the day, wipe down the engine with a soft cloth, empty the steam oil lubricator and empty the boiler. Many engineers will refill the lubricator with steam oil so it is ready to go. When storing the engine, leave the steam regulator, gas regulator and the reversing gear valves slightly open to relieve pressure on the valve

seats, seals and rings, but do make sure the butane is bled out and expended outdoors away from any open flame. Whichever way you go, be consistent so that the next time you run, you wont forget any important steps.

The Steamers Toolbox

In the beginning of this article, the most important items that belong in a steamers toolbox were mentioned, but there are other items that you will want to have at hand. Many of these items will be accumulated over time. It is very interesting to watch your toolbox grow over time. My toolbox is huge...three drawers and it's on wheels. Here is a list of tools, engine accessories and *stuff* that you may want to collect over time:

- Spare O-rings, washers, screws, nuts, gas filler valve, etc. for your engine. Often these are shipped with the engine as accessories.
- Small metric open-end wrenches.
- Needle nose pliers.
- Small slotted and Phillips head screw drivers.
- Spare batteries (if running radio control).

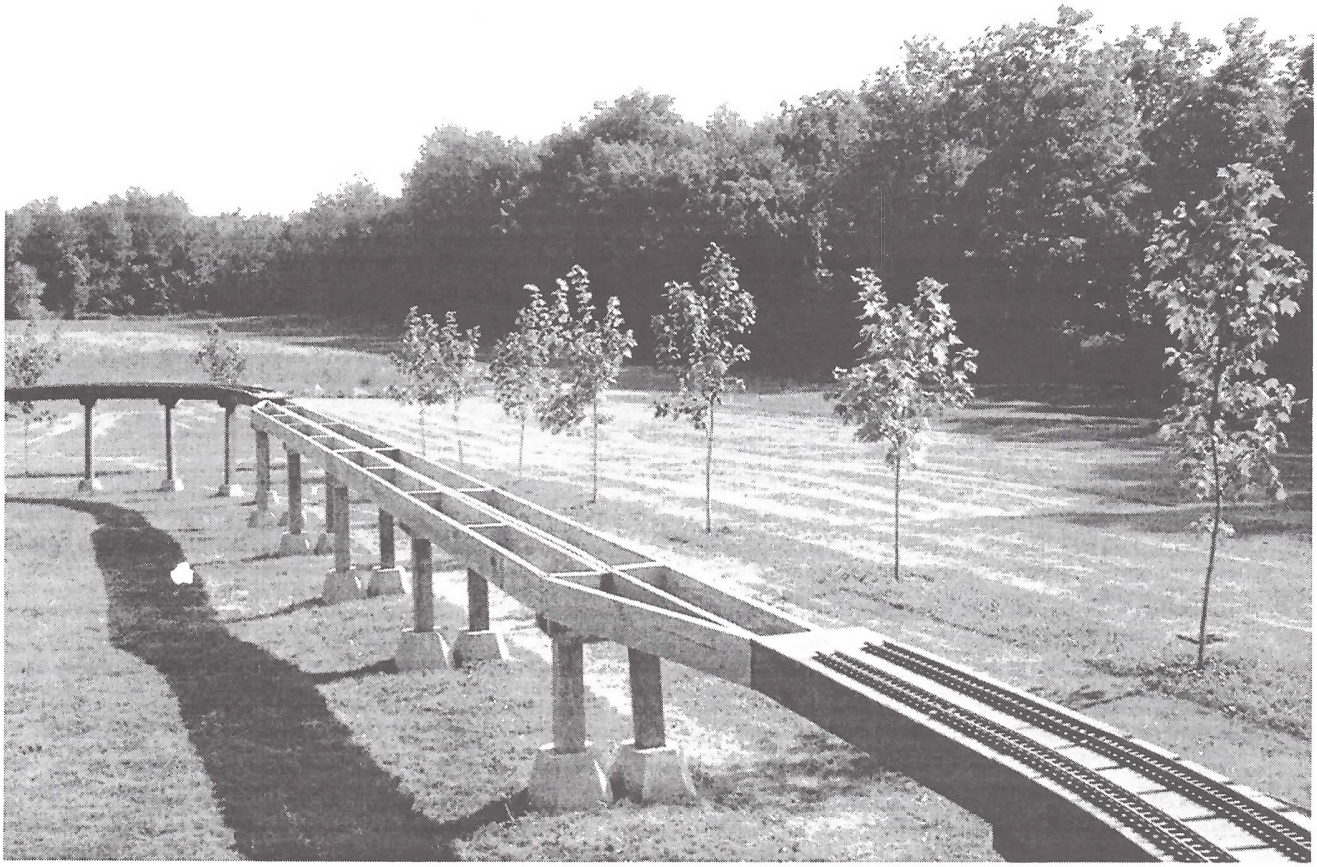
This article should have given you enough information to get you started on the right track to enjoying the small-scale live steam hobby. Now go out and raise some steam!

In future issues we will look at General Maintenance of Small Scale Steam Engines, Safety While Steaming and Building a Raised Live Steam Track.

Please send any questions you may have or ideas for articles you would like to see to the author in care of the editor. Good steaming and be **SAFE!**

Photo below: Work continues on the author's elevated steamup track in upstate New York. This photo shows the addition of a siding, which will be complete by the time you see this.

photo by Chuck Walters



Workshop Project

The Resonator Whistle

Part I

by Larry Bangham

This article, part of a series, is directed toward all serious whistle advocates and aspiring builders involved in gauge one steam. The first installment covers some of the history, the development, and an overview of the major elements of whistle systems.

Installment number two will cover many whistle building bits of wisdom and will present the different types of resonators and the soldering techniques used in their fabrication.

Installment number three and subsequent installments will present, in text, detail layouts, and drawings, the whistle systems for many different locomotives including the Aster U.S.R.A. light Mikado, Big Boy, Daylight, Beyer Garratt, C&S Mogul, Accucraft Ruby, C-16 two versions, Pearse Colorado, Roundhouse Argyle, Sandy River, Catatonk Heisler, 14 ton Shay, D.J.B. Engineering K-27, class one Climax, Hemmens Porter, and more if time and the tides of fortune are favorable.

To the uninformed, a resonator is a cavity of a specified volume which, when coupled to a normal whistle aperture, will lower the pitch to a more realistic frequency than is otherwise attainable within the limited confines of gauge one locomotives.

The Evolution

Early resonators

The published references to small scale steam resonator whistles go back almost a hundred years. "L.B.S.C." mentions Carson's locomotives as having resonators back in 1909. The drawings and descriptions of the early resonator whistles all indicate that the resonators were mounted above the whistle, presumably so that condensation drainage could occur in between blows. One of L.B.S.C.'s designs shows the whistle laying on its side with the resonator connected to the upper side of the bell, and this apparently eliminated the blubber caused by condensation. I have found no mention in the literature as to the application of drain holes to purge the condensation.

With the resonator located above the aperture it would be difficult to disguise, so I imagine most engines had them mounted out of sight, not an easy task for gauge 1. I find this interesting because it is the freedom to disguise the resonator while leaving the aperture visible that allows many of the applications shown in this article.

So the introduction of the drain hole allowed for a completely different approach to resonator whistle design. I guess this is my claim to fame until somebody else out of the past comes forward. Another problem is that early whistles all seemed to use the "open mouth" type of aperture which, not being adjustable, like the throat gap type of aperture, is more difficult to match to a resonator.

The Harmonic Resonator

Being completely unaware of the past experiments, (blissful ignorance), my involvement with resonator whistles started in 1995 with a rather fortuitous chain of events that began with reading one of Peter Jones's "Gazing Into the Fire" articles (see *SitG* issue № 30).

I was prompted to blow across a curved tube that was necked down on one end (see *SitG* issue № 35). The result was a high sound when blowing on the large end and a beautiful low sound on the small. Could a steam whistle be built utilizing this principle? Prior to this development the only whistle I had created, besides puckering my lips, was out of a hollow stem of wild grass.

So, before testing could begin on the necked down tube idea, I had to develop a small aperture that would give the basic note to start with. This process has been a continuing one and has resulted in the development

of the machined aperture which is now in use.

The first prototype whistle was named the Harmonic Resonator. Since to my knowledge this was a completely original idea, I had some original thoughts on why it worked, and one of these attributed the lower sound to a harmonic resonance created by the additional volume. This theory was discounted by Helmholtz who, unbeknownst to me, had documented this phenomena more than 100 years before, (see below).

The parts that in the beginning were the most difficult and mysterious have since evolved to become the easiest and most predictable. Discovering and defining the critical relationships has allowed these parts, the aperture body and aperture housing which make up the basic whistle, to be reproduced by modern machining processes rendering them reliable and affordable. More on this later.

Let me digress; for those not familiar with the physics of whistles, I will offer a quick primer on their operation.

Theory

The production of sound in a whistle is controlled by two critical gaps. The ring gap and the throat gap. The ring gap is the annular clearance around the aperture located at a critical distance such that it focuses the incoming steam into a high velocity, evenly distributed jet which intersects the end of the bell. The critical distance is affected by several variables, such as pressure, ring gap width, gas density, temperature, alignment etc. This critical distance is the throat gap and is adjusted by moving the bell back and forth.

Whistle building in the smaller scales has been considered somewhat of a black art because seemingly infinitesimal changes can result in very large differences. This is so because a finely tuned whistle is a mechanism in delicate balance. The smaller it becomes, the tinier the allowable deviations become. The accepted whistle operating theory was very eloquently related to me in a letter from Peter Trounce a few years ago. The gas jet is focused on the end of the bell in a manner that allows pressure to build inside. When the pressure builds to a critical point the jet is deflected to the outside allowing the bell to dump, which then allows the jet to deflect in, repressurizing the bell etc. So the bell becomes an oscillator. The speed of the oscillation is determined by the bell length, the time that it takes for the pressure wave to travel to the end and back. So the sound is produced at the mouth of the bell by the oscillating gas flow, and the pitch is a function of the bell length, which determines the oscillating frequency.

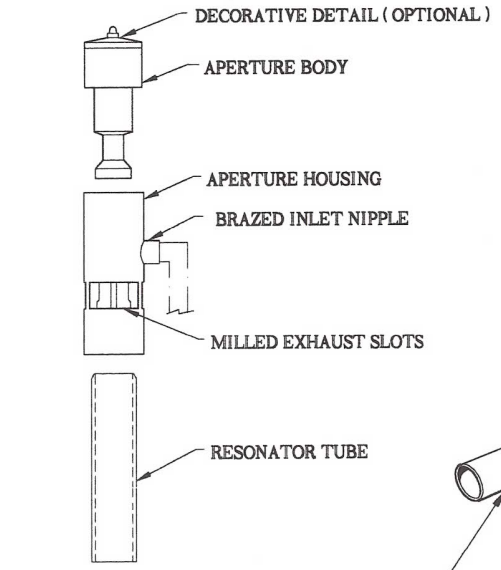
In a resonator type whistle the resonator tube acts as the bell and the pressure wave entering the resonator tube is slowed or dampened by the volume of the resonator cavity. According to Hermann Von Helmholtz (1821 - 1894), who was the first to document this phenomena, the mass of the cavity acts like a spring or weight dampening the wave. The result is a lowering of the pitch proportionally to the difference in the size (diameter and length) of the resonator tube relative to the volume of the resonator cavity. In a normal whistle an increase in the diameter of the bell increases the wave amplitude resulting in a louder sound. In a resonator whistle an increase in the resonator tube diameter results in less dampening of the sound wave, resulting in a higher pitch as well as a louder sound. This is the reason why, that as the whistle and aperture get smaller it takes less resonator volume to produce the same low pitch. Interesting, what!

A cursory glance at the two sketches below shows a similarity in shape and function, but upon closer examination it can be seen that, except for the addition of the resonator, the resonator whistle is really a normal whistle with a funny right angle bell that has been turned upside down. The bell has become the tube that goes to the resonator. Turning the whistle over allowed the aperture body and housing to be disguised as the bell and the resonator to be hidden inside the dome. The deflector causes the steam to rise in a plume like a normal whistle.

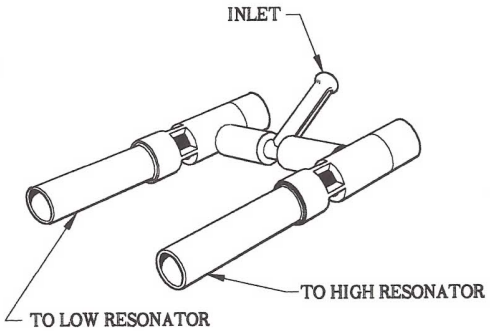
A complete resonator whistle system is comprised of five major components. 1. The aperture assembly, 2. the resonator, 3. the whistle valve, 4. the steam tap or manifold, and 5. the piping to connect everything. All are equally important to the success of the system. I will touch briefly upon current designs for each of these items.

Aperture assemblies

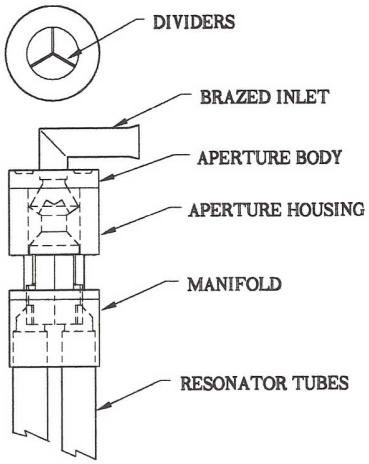
There have been many developments in aperture design since my last article on the subject. The first aperture housings were made using K&S thin wall brass tubing. The exhaust holes, where the sound comes out, were drilled radially around the periphery. However, the round holes did not provide a good reference surface for the whistle jet, so a straight edged sleeve was required between the aperture body and housing. The thin walls plus the sloppiness of the sliding parts made for a rather unstable assembly which required some guess work and trial and error to achieve suc-



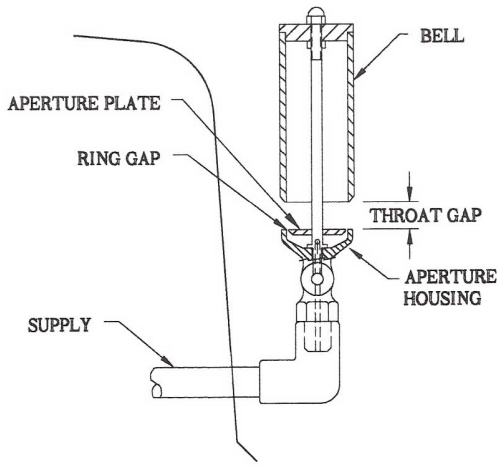
G.P. APERTURE ASSEMBLY



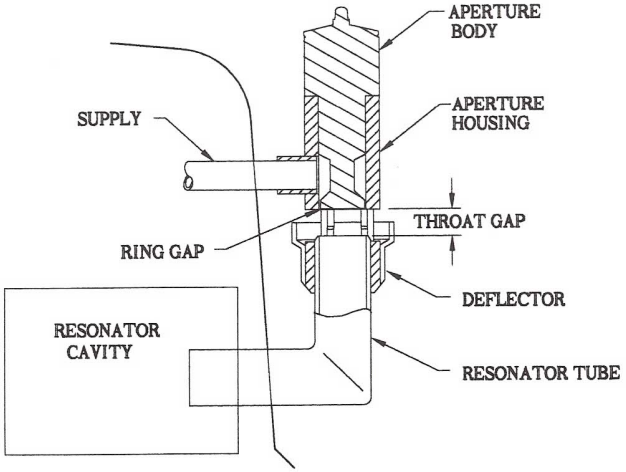
MIKADO - DOUBLE APERTURE



3 & 4 CHIME APERTURE ASSEMBLY



NORMAL DOME WHISTLE



RESONATOR DOME WHISTLE

whatt87

cess.

Changing the design to a completely machined part with milled exhaust slots provided a thicker wall, closer tolerance features, and nice flat edges to direct the steam jet. This eliminated the need for the aperture sleeve and provided a more stable part.

To further simplify the building process I have standardized on one aperture size for most whistle applications. Parts have been jobbed out to a machine shop and made in quantity using CNC on a Swiss automatic screw machine. This technology, which has only become available to the small producer within the last few years, is ideal for whistle making since all the parts created on the same program are identical to each other within about .0003 inch.

I call this the general purpose aperture, since it is suitable on narrow gauge engines for dome type whistles, cab roof mounted whistles, under the running board air tank whistles, whistles disguised as air pumps and probably many other applications not yet thought of. A pair of the same apertures is used on the Aster light Mikado to provide a multi-chime effect. This aperture is available in several configurations for those who, after finishing this series, might wish to try their hand.

The three and four chime whistles used on the Aster Garratt and Daylight use a larger aperture that is divided into sections.

Valves

The search for a suitable miniature whistle valve focused for a while on the Schrader tire valve. This valve met the requirements of small size, reliability and availability. It has a couple of shortcomings; the oddball thread size of the valve stem, (a 12-36 tap using an under size (.177) tap drill works for the female, or an M5.2 x 0.7 die (.205-36), not normally available, for the male), and a rather limited delivery volume. It works fine for most single chime whistles but has too great a pressure drop to get the full volume of a multi-chime whistle.

The search came to a conclusion shortly after my friend Les Bedding called and asked if it might be possible to use the Del-Aire air toggle valve as a whistle valve. I told him I would try it and find out. Another friend, Arnie Hoffman had given me a couple only a few weeks before. The valve certainly looked big enough to handle any gauge 1 whistle, and hooking it up on air verified that initial impression. Upon dissecting the valve I was amazed at how small the spindle and 0-rings were. About 90% of the valve bulk is solid brass. I replaced the plastic nipples with brass and hooked it up to my shop boiler and was surprised at the output volume.

This fortunate chain of events inspired me to lay out the valve on CAD and see just how small I could make it. Several internal changes were made and the bore was increased slightly to handle an available high temp 0-ring. I called Greg Spence at Del-Aire and learned that the valve was originally designed to operate a dental air drill. This explains the exceptional throughput. The resulting size is smaller than the Schrader and yet handles roughly twice the flow.

I had a quantity of parts made incorporating the design changes. One change eliminated the tendency for the 0-rings to roll out of their seats under heat and pressure. The combination of small bore and a cam action lever with long travel results in good modulation, allowing the engineer to quill the whistle with a little practice. I call the valve the Bedding valve after my source of inspiration.

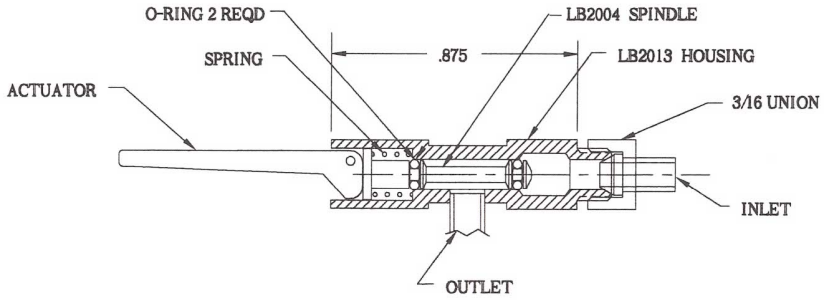
Typically the whistle valve is mounted in the cab. However, for best operation the valve should be located close to the whistle and the steam source, just as it is on the prototype. The ideal arrangement is found in narrow gauge dome whistles where the source, valve, resonator and whistle are all placed in and on the dome. I wish the same technique could be used on mainline 1:32 scale engines. As a compromise, the Aster light Mikado has the valve located on the side of the boiler between the source in the steam dome and the whistle under the front end.

Manifold

The steam source is required to be high on the boiler to prevent priming when the valve is opened. The simplest installation is on an engine with a suitable unused bushing on the backhead. The furnished plug can often be used to make an adapter, with the 3/16-40 valve thread tapped directly into it, or with a short length of 3/32 copper tube brazed into it terminated with a 3/16-40 union nut and cone to mate with the Bedding valve.

On a narrow gauge engine with the safety valve inside a large dome, the manifold can be mounted inside the dome in the safety bushing and incorporate a 'Y' which splits the steam path. A small safety valve similar to the Aster C&S Mogul or Wada Dockside is mounted on one side with the supply to the whistle valve in the other.

Banjo type fittings utilizing gaskets machined from Rulon-J make excellent steam manifolds and can be assembled dry requiring very little torque to seal. This type of fitting is used on the Aster light Mikado, located in the water fill bushing under the steam dome.



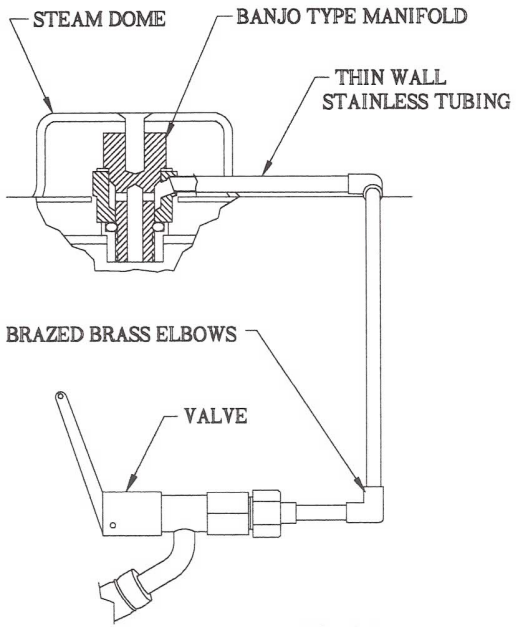
THE BEDDING VALVE

THE ACTUATOR AND OUTLET ARE CONFIGURED TO SUIT THE APPLICATION

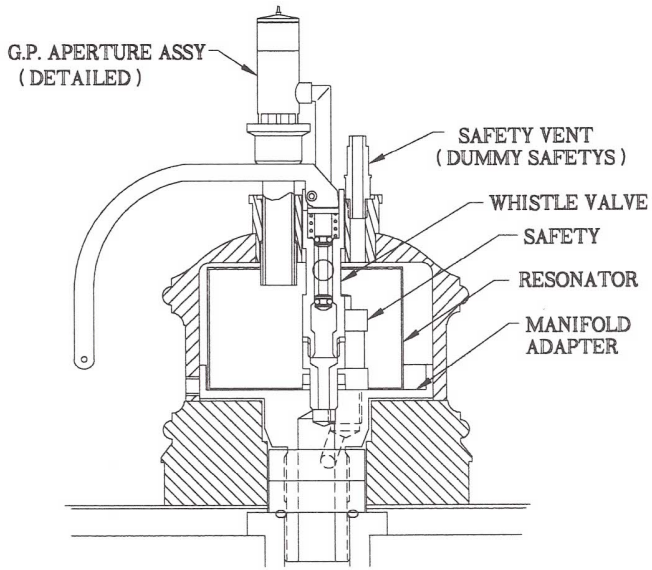
SCALE 1.5

L. BANGHAM 7-20-01

valve7



ASTER U.S.R.A LIGHT MIKADO



ACCUCRAFT C-16 #42

Piping

The minimum size thin wall tubing (.014 wall K&S or equivalent), that can be used with the GP aperture is 3/32 OD. A double aperture whistle, like the one for the Aster USRA Mike, would normally require a 1/8 OD supply tube. But in this case the tubing is visible on the outside of the boiler so a smaller diameter *(.095),* extra thin wall *(.005),* stainless steel type 304W tubing is used. This provided a suitable cross sectional area with a more pleasing scale like appearance. This tubing has a low thermal conductivity which makes it ideal for steam service. However, it requires special care in bending, cutting and brazing.

As a side note, I used this type of tubing to make resonator tubes in a four chime whistle that I wanted to demonstrate for Dan Pantages in his Daylight locomotive at the 2001 California Summer Steam up. Unfortunately, due to its poor thermal conductivity, the whistle took a long time warming up, and if you have ever heard a steam calliope starting off cold you know the ungodly sounds the whistle was putting out coming up to temperature. We won't do that again.

On visible runs, elbows provide a more realistic appearance than bends. A 90 degree elbow can be made from brass tubing using a square file to cut a 90 degree 'V' notch almost through, and then bent over and brazed.

Stay tuned for the next exciting episode.

John Thomson's Coal Fired 0-2-2 Logging Locomotive THE DONKEY

Reviewed by Jim Crabb

Features:

- Inexpensive way to get into coal-firing
- Everything you need to get up and running, including coal shovel & pricker tool
- Easy start-up with paraffin-soaked hardwood charcoal
- Working pressure in under 5 minutes using external start-up blower
- Steam blower effective starting @ 10 psi
- Water supplied from tender with hand pump
- Blast pipe allows engine exhaust to help draw the fire while loco is running
- Will run for 60 minutes on 4 oz. of coal and 16 oz. water
- Boiler available separately, and could be installed on nearly any 1/20.3 scale locomotive requiring a vertical boiler

Specifications:

Length: 9-7/8"
Width: 3-3/4"
Height: 9-1/4"
Scale: 1/20.3
Gauge: 1 (45 mm)
Weight: 2-3/4 lbs. Boiler only: 12 oz.
Boiler Height: 8.5 "
Boiler Diameter: 2.3 "
Boiler Type: Vertical, Center flue, Dry leg, Silver-brazed copper, lagged with ceramic fiber inside jacket, and wood outside
Boiler Jacket: .015" brass
Cylinder lubrication: Displacement type on loco platform
Cylinder: Single oscillator, Bore: 3/8"; Stroke: 1/2"

Drive Type: double ladder chain reduction, total ratio: 5.56:1
Water level gauge: 3/16" glass tube type
Water injection: through one-way clack (check) valve from hand-pump in tender
Feed Water Pre-heater: Flash type in firebox
Pressure gauge: 3/4" x 0-60 psi with siphon
Grate: Stainless Steel; Area = 3.97 square inches
Water Capacity: 100 ml (3.5 ozs)
Working Pressure: 30-42 psi
Safety valve: lifts at 42 psi
Steam blower: fixed-orifice type, controlled by regulator valve
Blast pipe: built into stack and fed by engine exhaust
Fuel: Hardwood charcoal; Welsh Steam Coal
Price: $1595.00. $1495.00 if you supply BAGRS kit or parts

Enclosed Water Tender:

3-1/2" wide x 5" tall x 7" long wooden superstructure on HLW frame with 4 steel wheels and enclosed 15 oz. capacity stainless steel water tank with brass hand pump. Pump handle is detachable, and extends through slot in lid of tender. Tender lid is removable for filling. Since there is no prototype, this tender was designed to be functional, yet plain, in order to allow for 'bashing' by those who are so inclined. Color: Flat black.
Weight: 1-5/8 lbs. Price: $400.00

Open Water Tender:

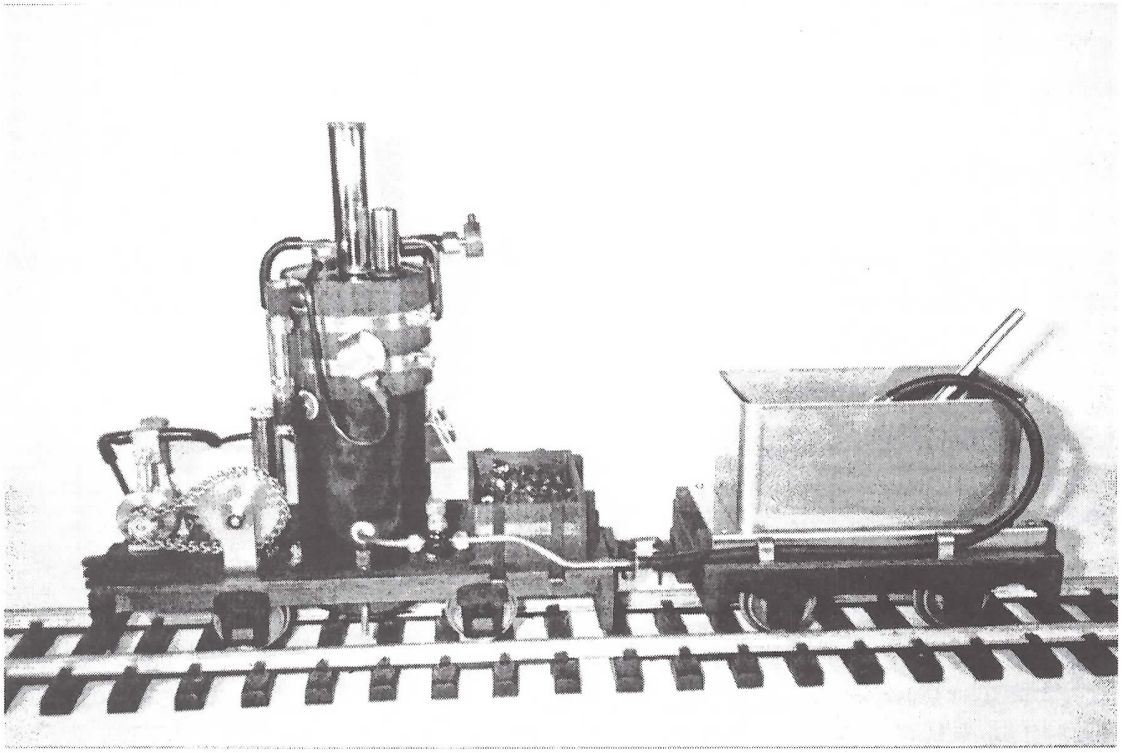
3-1/4" wide x 5" tall x 7" long wooden superstructure on HLW frame with 4 steel wheels and 15oz. capacity stainless steel water tank with brass hand pump. Pump handle is detachable. The red mahogany stained deck with buffer beams over black flatcar match the color scheme of the loco. Since the water tank is open, it can be easily filled, and topped off 'on the fly'. Weight: 1-1/2 lbs. Price: $350.00.

Available from:

John Thomson
4321 Crestover Dr.
Mesquite, TX 75150
972-226-3229
e-mail: jthomson@flash.net

Logging With the Donkey

...in order to remain active after its heavy duty role in the forest was diminished, the little Donkey made an easy transition from a crane or drag line to a pile driver on skids and eventually to a self propelled, chain driven engine on flanged wheels running on rail. (The Russell Wheel & Foundry in Detroit, MI actually manufactured at least two versions, a 2-line and 4-line combination skidder and loader -- generically called 'The Russell.' (See *Logging with Steam* by W. M. Harris.)



Donkey coal-fired locomotive with new oopen-type tender.

One would hardly call it a locomotive; and it certainly wasn't pretty -- in fact, ugly comes to mind -- but, technically it would have met the definition.

Due to its inability to reverse directions it was mostly used on short hauls around the mill and occasionally found work in other applications where gravity could be used for reversing directions. For example, a coal load could descend the hill from the mine to the loading wharf using gravity and the Donkey would pull the empty cars back up the hill.

Another application was at the NE Texas logging operation where the track was actually a point-to-point operation involving turnouts at either end, providing a continuous loop from the forest to the Sabine River and back to the forest again. Of course, this took more track but was a lot less expensive then a more proper locomotive which could reverse directions.

Other 'donkeys' still had cranes attached and were used to off-load the logs into the water. Previous use had already proved in Arkansas that some of those engines weren't very efficient in reverse anyway.

Just like its namesake, it was often a little temperamental (and not just because it wouldn't back up either) -- requiring constant attention to the balance between water, fuel and steam pressure. All of the operators (now we would call then engineers, but back then they were known as handlers) loved to oversee the Donkey. It wasn't very efficient but it was powerful and cheap to run. It was very forgiving of untidy track and sharp curves....

Okay! So part of the story has been fictionalized (some English teacher is surely turning over in her grave now) to provide a proper background for a unique live steam engine (er, locomotive).

Anyone who has been a faithful reader of these pages over the past couple of years is well aware of the terrific modifications that John Thomson made to the humble BAGRS engine. Some cost less than 50 cents and none were unreachable. He epitomized the

expectations of Mike Martin, et al, in designing an entry level live steam locomotive which could be freely enhanced as the owner interest grew and matured. Well, John has really gone over the top now-in fact, it only still resembles the BAGRS engine in silhouette. It is a genuine, gosh darn, coal-fired locomotive!

Over the past couple of years I've heard some negative press when it comes to coal-firing a locomotive -- too messy, no staying power, hard to do, not worth the effort, disappointing at best, no run time.....

The Operating Manual which comes with the 'Donkey' eliminates and/or addresses all of those concerns so that anybody with minimal reading skills and enough dexterity to drive a butane or alcohol locomotive can successfully drive and enjoy this entry level coal fired engine. 'Entry level' refers to cost only. The components should (if the maintenance schedule is followed) last for years and years.

John Thomson is very meticulous as he tackles each component -- (1) where to get coal, how to break it up, what size (2) charcoal, what kind, preparation, why (it is like kindling) (3) water, exactly how much to start, how and when to add it to the boiler (4) diagram -- there is no mistaking what you need to do, where you find the component, when to make adjustments (5) balancing the fire, water, steam pressure -- when to add coal, how much and how often to add water, how to maximize your steam....I'm telling you that no detail had been left out!

As previously reported in these pages, John mentored me (and others) at Diamondhead, and anybody can do something with an expert looking over their shoulder directing every move. The proof was when I attended a couple of steamups on my own and ran the engine flawlessly. The first time (at Marvin Nite's) I kept the engine in constant steam for 1-1/2 hours. The next steamup (Clark Lord's) I set a benchmark for myself by keeping the locomotive in steam, running continuously for 3 hours.

Since the engine has only one drive axle and is fairly light it prefers a fairly level track. Under these conditions I pulled a mixed train of six metal cars for 3 hours. Due to the constant need for water it has pretty short legs. A circle of 10 foot radius is about 66 feet -- four times around without tending is about 260 feet. That is the maximum running one can get without attending to water. Plans are already underway to make an axle pump available later. If a tighter radius track with a few grades is all you have - no problem, just run a shorter train.

When running for a long time it isn't necessary to provide any additional lubrication to the chassis, but the steam oil in the lubricator needs to be added every 45-60 minutes.

The shut down procedure is very easy -- close the throttle and the draft and you will lose your fire almost immediately. Pump it almost full of water and you will not only diminish whatever steam was left in the boiler but you are ready for the next run.

The cleanup procedure is again very straight forward -- pull a pin to drop your fire. Use the included stainless steel hand brush to clean the grate and a little 'canned' air to blow out the ash in the firebox and you are ready to run again.

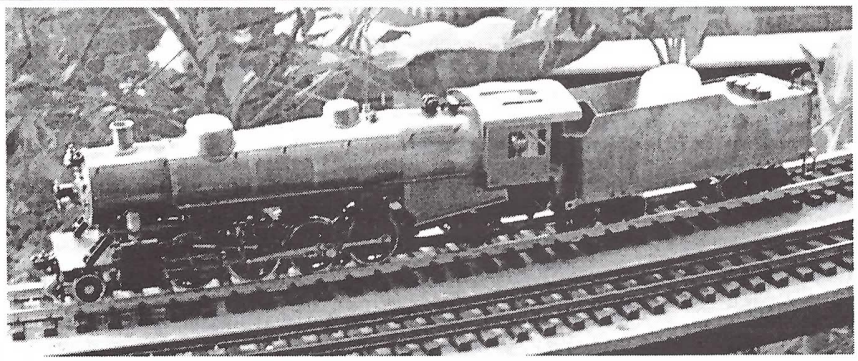
When you are finished running for the day, there is another detailed list for more extensive cleanup which will take about 15 minutes. This primarily deals with cleaning the grate, firebox and the single flue which runs through the boiler.

The ultimate test (in my opinion) is: can you teach another person? The last run of the day at the Las Vegas steamup was run by Clark Lord, to whom I gave about 10 minutes of instruction and walked away. He ran the engine flawlessly for 30 minutes before deciding to drop the fire.

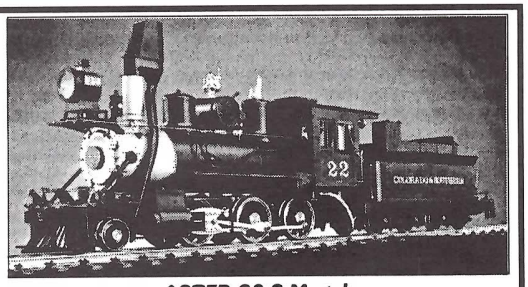
The Donkey is offered with several accessories, including custom made tools for shoveling and tending the fire, enough coal and charcoal to get you started, and tools for cleanup.

Two water tenders are available. One is the original black enclosed tender, with stainless steel water tank and brass hand pump. The other is an 'open' tender, with exposed water tank and pump mounted on a flatcar.

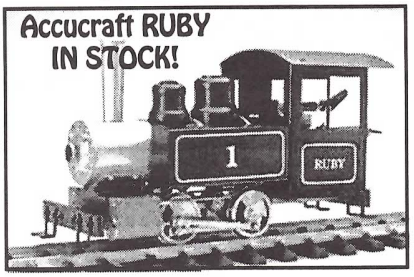
The most important caveat I can offer is that this aspect of running live steam is very addictive. I moved away from sparkies because I really liked the 'fiddle' component of real miniature engines. This is the ultimate.



Aster's Magnificent Mikado



ASTER C&S Mogul



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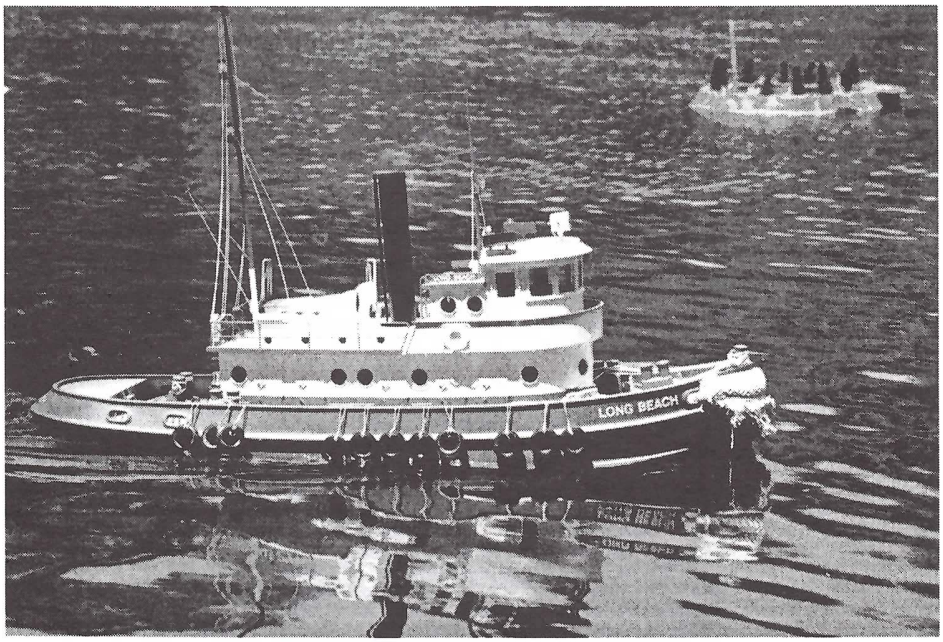
13th Annual Steamboats-Only Regatta at South Orange

report and photos by Steve Siegel

Sunny, if a bit breezy, skies greeted the 20 model steamboats that participated in the 13th Annual Steamboat Regatta at Meadowland Park Pond in South Orange, NJ on June 2nd. Cheers to Ron Hermann, Charlie Roth, and various members of the South Orange Seaport Society for hosting a great event. Maybe ***breezy*** is a bit of an understatement, as 20MPH+ gusts managed to capsize two launches while they were on the precision steering course, as well as blowing two other boats off their display tables! Fortunately, the sunken boats were quickly recovered by the fast-acting rescue crew, and the other two models suffered only minor damage.



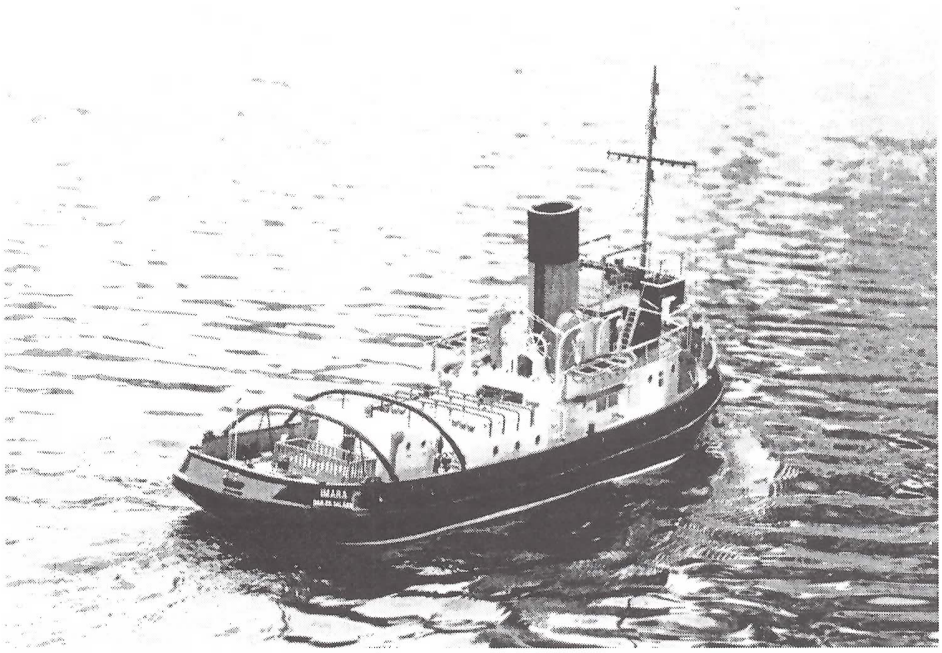
Robert Brent's Long Beach tug.

It could have been worse! One of the capsized craft was the stunning scale model of Feeble, totally scratchbuilt by Livingston Morris. This is an exact scale model of the Weston Farmer 12ft launch built from plans published in the December 1943 issue of The Rudder. The double-acting single cylinder engine is a Henry Greely design, and has dimensions of 7/16" bore by 5/8" stroke. All original materials were used: cast iron, bronze, etc. The vertical fire-tube boiler is coal fired. Livingston certainly deserved the coveted ***Modeler's Choice*** award that he received for this fine model. It is a shame that while the boat was recovered pretty much intact, the rudder access cover hatch was lost, a part which contained a remarkable miniature machined brass latch (many hours of work, I can imagine).

Elliot Kaplan brought his newly repaired Angelfire yacht, now powered by a Saito T2DR, which won him first place in the oval race event. His other project was a very interesting modification of the new Midwest Elliott Bay launch, which included a Kitchen rudder of Elliot's own design. This feature allows the simple single-acting, single-cylinder Midwest engine some degree of throttle control as well as forward/reverse. Unfortunately, the wind was too strong for it to take to the seas. Elliot also added a planked deck, displacement lubricator, and vertical steam exhaust to the model.

Frank Bock had his Krick Victoria launch operational, with its Graham TVR1A engine and Hemmens boiler. Bill Schappert had his usual fleet of steam craft, including a Brooklyn tug with scratchbuilt boiler, a Seguin tug powered by a Saito V4, and Boy, a 44" fast speedboat (really fast!) featuring a scratch-built boiler and alcohol burner firing a Stuart Turner 2-cycle Sun engine. Bill took home first place honors in the drag race with Boy.

And speaking of fast, Joseph Hanulec was back this

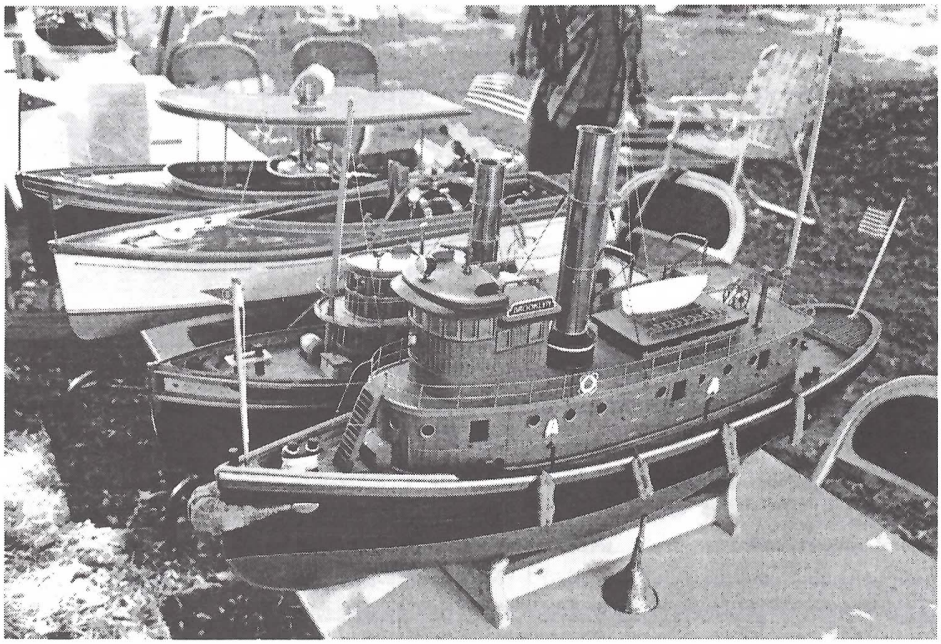


Ray Suder's Imara manuevers on the South Orange course.

year with his 60" Coast Guard Cutter powered by a home-made semi-flash monotube boiler and 90 Deg V twin engine. The boat presented a magnificent display of raw power and speed as it cut a path through the pond like a knife through butter.

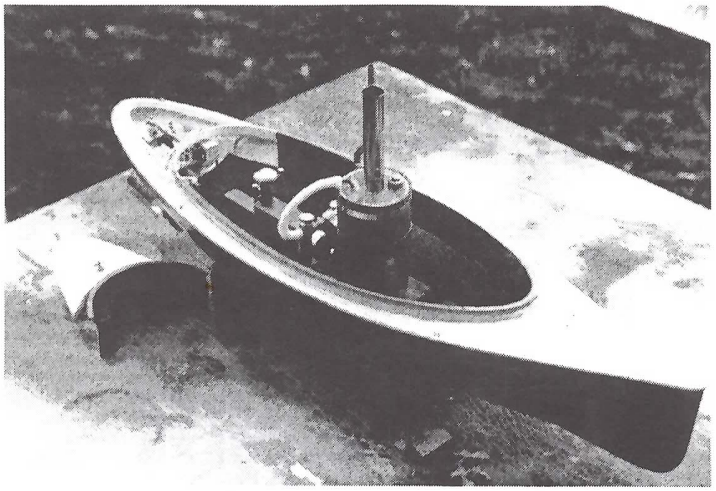
Quentin Johnson brought his impressive 1:24 scale model of The City of New York, a propeller driven Chatauqua Lake steamer from 1892. This highly detailed scratchbuilt model was powered by a Stewart D10 and propane-fired fire tube boiler. The gusty winds, however, only allowed Quentin to run the course sans superstructure. This still netted him second place in the drag race.

My apologies to those whose boats I have not mentioned. Each participant received a hand-crafted plaque made by Ron Hermann on which was mounted a miniature port-side running light cast in resin. Really neat! And all those who return in 2003 will receive a matching starboard-side plaque to complete the set. Many thanks to my wife Donna for her ***on the scene*** note taking. I hope the included photos will be of interest. Here are the winners of the various regatta categories: ***(next page)***

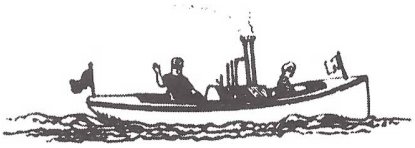


Bill Schappert's fleet: Patty, Boy, Seguin and Brooklyn.

Modeler's Choice ..... Livingston Morris
Engineering ..... First Place: Bob Hay
Second Place: Bill Schappert
Third Place: Livingston Morris
Precision Steering..... First Place: Jim Edelen
Second Place: Bill Schappert
Third Place: Bob Hay
Oval Race ..... First Place: Elliot Kaplan
Second Place: Bob Hay
Third Place: Joe Hanulec
Drag Race ..... First Place: Bill Schappert
Second Place: Quentin Johnson
Third Place: Bill Ray



Elliot Kaplan's modified Midwest Elliott Bay launch

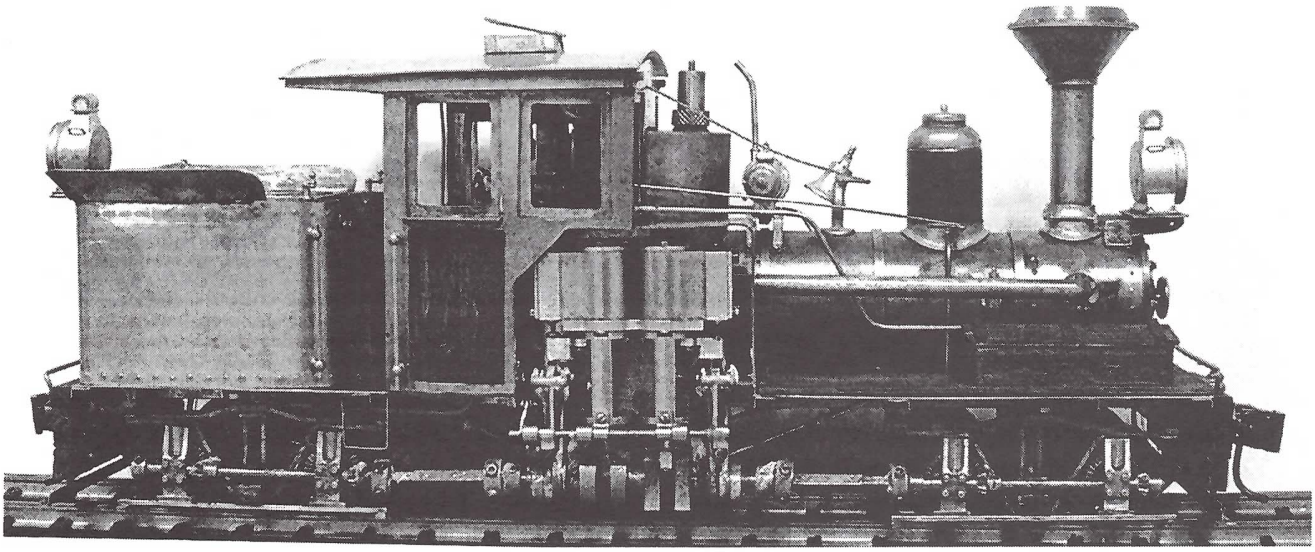


Workshop Project

Episode II - The Tee Boiler Strikes Back

text, photos and drawings by Les Knoll

In Episode I I talked about some modeling philosophy, scratchbuilding, and construction of trucks, universals, and the locomotive frame. In Episode II, 'The Tee Boiler Strikes Back', I'll discuss building a working Tee boiler and firing systems, and talk about radio control and some Shay detailing information.



The author's Shay, completed but unpainted.

Plans called for a fully functional 'tee' boiler, gas fired, with working vertical expansion chamber. My previous Shay had a straight boiler with a simulated, non-functional 'tee', sorta like a Shay with a hairpiece. Most all the Shays of my chosen size and era had quite skinny boilers, on the order of 30" to 32" diameter. To get down this size, I made the horizontal portion of the boiler from 1 5/8" OD copper tubing. This corresponds to a 33" outside diameter, close enough.

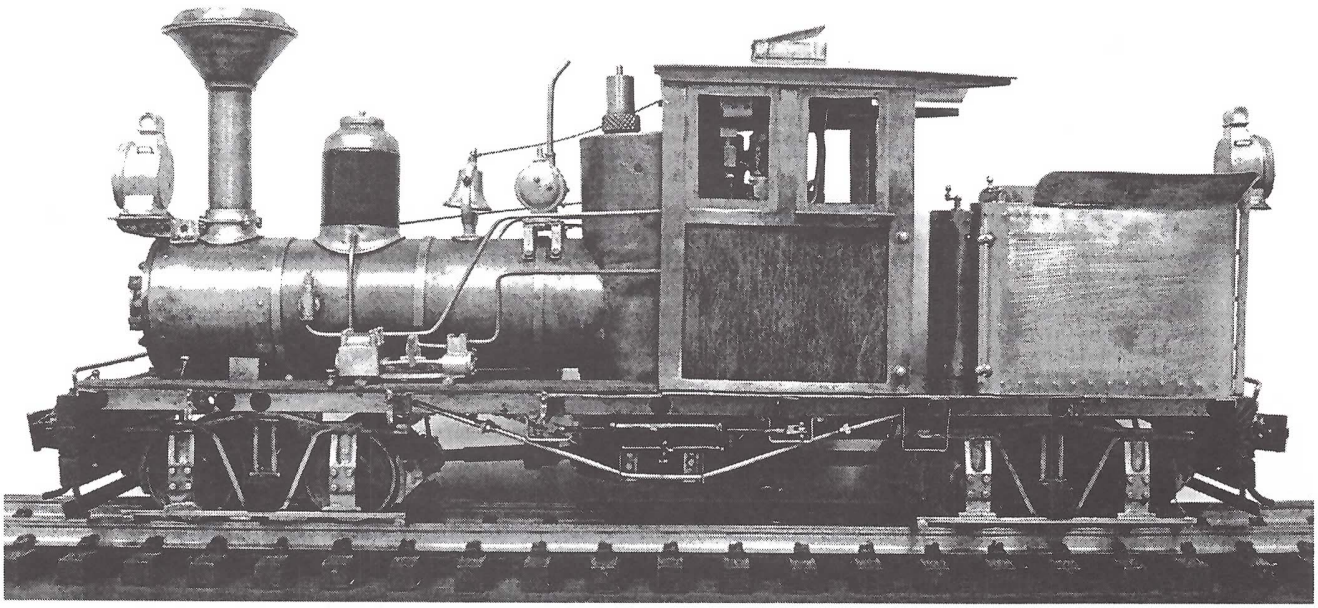
The height of the 'tee' section was determined from CAD conceptual drawings of the locomotive. I carefully balanced 'tee' height and cab height along with boiler diameter to achieve a slightly gawky look. To me, proportion in a Shay is everything. The small diameter boiler and tall cab over it make for a pleasing bit of gawkiness. Too large a boiler diameter and the gawkiness is lost. Too short a cab, again the gawkiness is lost, the Shay looks too streamlined. Too tall a cab, and the locomotive looks way too gawky. In my case with too tall a cab, my existing locomotives would appear too small next to the Shay. So much with the 'Proportion Wars".

Small diameter boilers mean reduced water capacity. The Shay's "D" valve engine with a .500" bore uses more steam than the 10mm bore oscillator it replaces. To get as much water capacity as possible, I used a 1/2" flue. This has rarely been tried before but to keep water capacity up I had to attempt it. To find out if this firing system would work, I made a 1/2" flue of the proposed boiler length, and the burner to go with

it. The burner mixing chamber (outside the boiler) is brass and presses snugly into the flue. No mounting holes are needed. It is nearly a direct copy of the Ruby burner with four air holes surrounding the jet. The jet is a .006" standard jet available from Sulphur Springs. The bodies or poker portion of the burners I worked with were made of 1/4" and 5/16" stainless steel tubing. A small round brass disc was silver soldered to the end of the poker.

a greater area and make for quicker steam recovery, so a locomotive does not have to stop to 'catch its breath'. This boiler would probably need a longer poker than normally expected since with a small diameter flue, the width of the heating area is reduced. One way to try and compensate for this is to increase the length of the heating area with a long poker.

The poker is a 5/16" OD stainless steel tube slotted as described previously. It is nearly half the length



Even the "boring" side looks pretty good with the added detail.

During this construction the breakthrough article by Kevin O'Connor appeared in *Steam in the Garden* on radiant heating to increase burner efficiency. Although I did not follow the new construction in my burner due to flue size constraints, Mr. O'Connor's instruction on how to properly slot a poker burner was absolutely invaluable, worth the entire article. Thanks a million, Kevin!

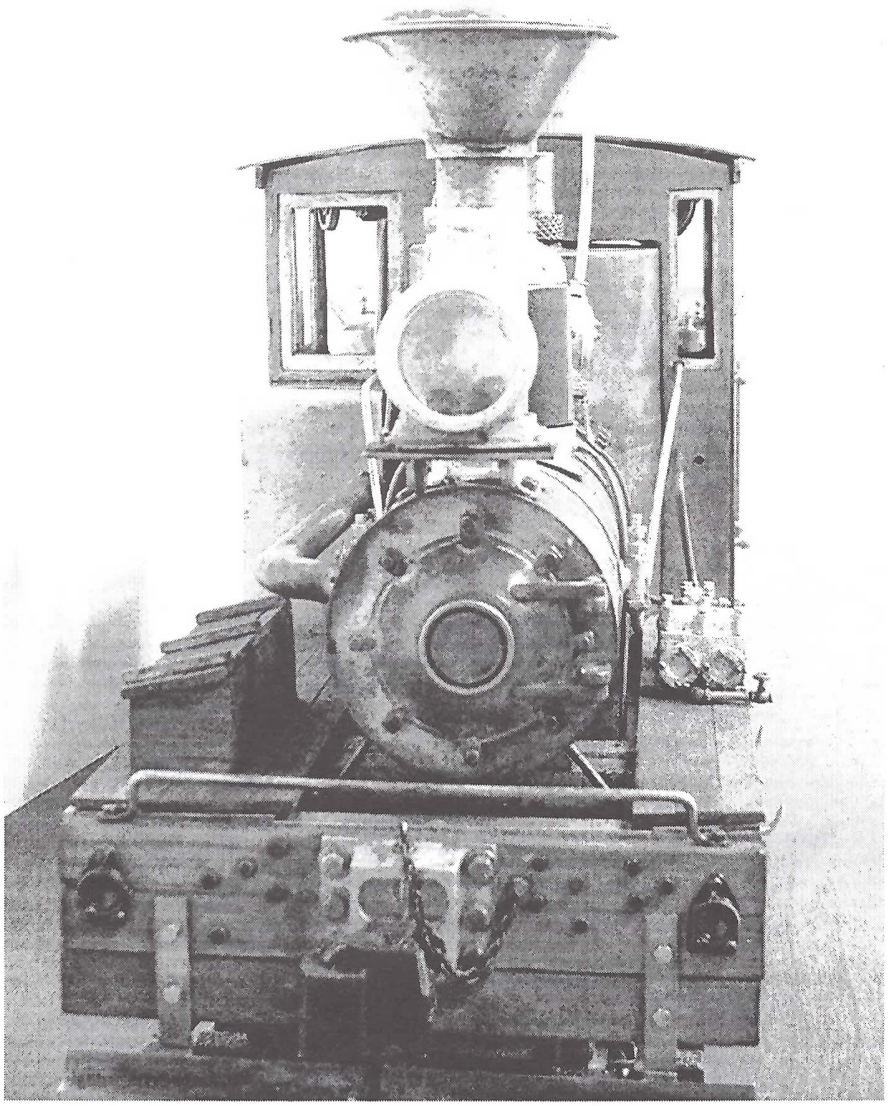
He says that .100" is the optimum slot spacing, and that the slots closest to the front of the burner are to be extremely shallow, just barely breaking through the poker tube wall, increasing in depth as you go rearward.

With my burner and flue mockup I was able to find out what combination of burner length and diameter would work the best. I must have made a dozen or more pokers. Fortunately the mixing chamber portion was reusable. From my work with boilers on my 2-4-4-2, I found that longer burners distribute heat over

of the boiler. Firing tests using the flue only showed that I would have flames shooting through to the smokebox if I turned the gas too high. This did not happen until the test flue had been heated up. This must be a direct consequence of a good sized burner in a small flue. I figured that the water surrounding the flue in the actual boiler would keep the flue temperature down, thereby eliminating a smokebox fire.

With these initial tests complete, I started the boiler shell. I used 1-5/8" OD .0625" wall copper tube for the horizontal portion, and 2-1/8" OD .0625" copper tube for the vertical or 'tee' section. The hole in the 'tee' section for the 1-5/8" horizontal boiler section was made using a bi-metallic hole saw made for metal cutting. The 2-1/8" tube was clamped in the vise of a Bridgeport milling machine, a pilot hole for the hole saw put in, and slowly and gently the hole saw was plunged into the copper tube. Hole saws can tend to be oversized. To make sure the hole I cut would not

be too big and require too much silver solder filler, I rotated the outside of the hole saw around a grinder to grind down the portion of teeth protruding beyond the body of the hole saw. This reduces the size hole the saw cuts, but also cuts down on the saw's ability to remove chips. The inside of the teeth were untouched and still protrude to the inside of the hole saw body, aiding in chip removal. This turned out to be a far easier operation than I thought. The horizontal section had a nice snug fit into the 'tee'.



Front view...

The top and bottom ends of the vertical section were slightly counterbored for the .060" copper discs that would fit in them. The discs were made by scribing the proper diameter circle on sheet copper, rough cutting with a saw, then soft soldering a 1/2" round to the circle's center and turning the edge of the disc with a lathe. Copper is no fun to machine!

All the holes for fittings were drilled before the silver soldering was done. Center lines were lightly scribed in the boiler sections so things like smoke stacks, safety valves and the like would line up after soldering. Holes for filler, sight glass, throttle, etc. were drilled. Tapped holes were put in for inserts that would be silver soldered in the boiler for mounting the generator, bell, check valves, and sand dome. This is admittedly a tedious practice and is doing it the 'hard way', but it means that all boiler components bolt on. No details are soldered on and they can be removed if necessary. The holes for bushings and inserts are made slightly undersize. Silver soldering distorts the holes and when soldering is nearly complete, the holes are re-drilled. After drill shavings and chips are removed the bottom of the 'tee' section is soldered in as the final operation.

My 'nothing is going wrong' project suddenly took another turn. It took me three attempts to get a workable boiler! In the first attempt all machined parts went well, but in soldering on the bottom of the 'tee' section I burned a large hole in the joint between the 'tee' section and the bottom cap. I was not used to my employer's torches, and they have far more heat available than is needed to solder a small boiler. 'Melt' might be a better term. I decided I did not want a large silver solder 'bandage' on the side of my boiler, and scrapped the first attempt.

On the second attempt I decided I would try a different order of manufacture and put a finish lathe cut on the top of the 'Tee' section after the boiler was silver soldered. Wrong! The copper had softened from all the heat, and my boiler twisted like a pretzel in the lathe.

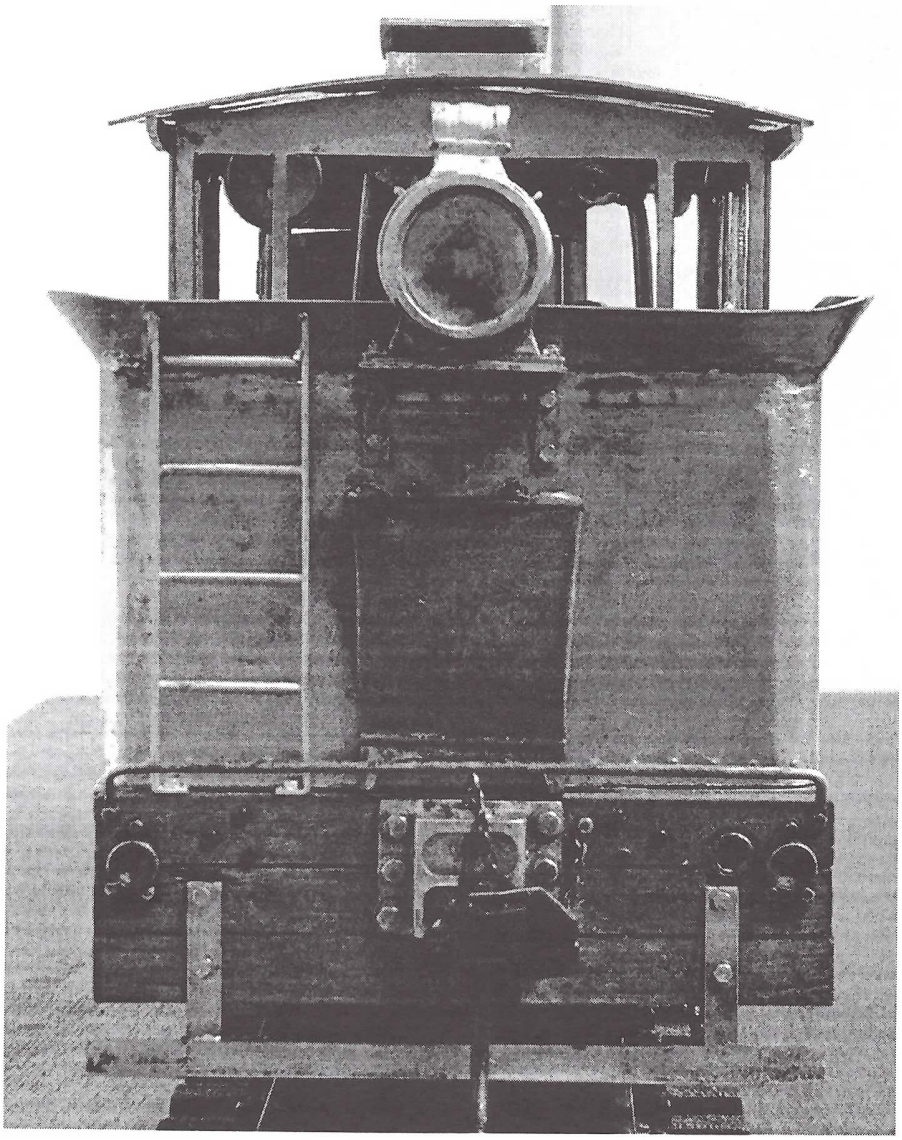
The third time was the charm. I followed the previous method of fabrication, soldering on the 'tee' bottom last, and finishing the 'tee' top with a grinder. The boiler body, all threaded inserts, and the flue were silver soldered. The bushings for the sight glass, safety valve, water level valve, the throttle/filler turret, and lines for the pressure gage and water feed to the gas bath were soft soldered. This has proven to be satisfactory and will be as long as I keep water in the boiler.

Sight glass alignment is always a problem in installing boiler bushings. I disassembled my sight glass and inserted a brass rod where the glass would go. I put the bushings on the sight glass fittings and using the sight glass fittings themselves as a guide, soldered the bushings in. The rest of the bushings were straightforward. The throttle 'turret' contains the bushing for the throttle mount as well as the filler cap/ Goodall valve and a hole in the side for the pressure gage line. Four fittings for the price of one.

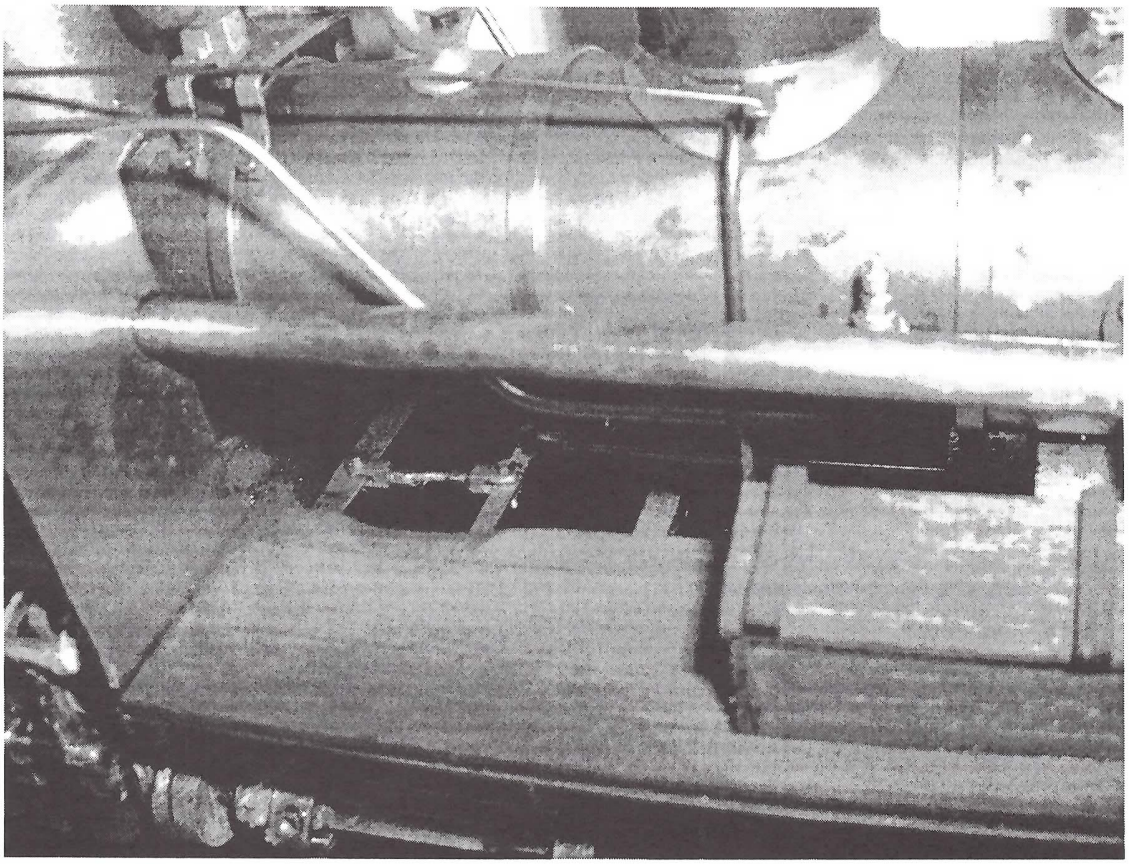
As a sealant where the fittings meet gaskets and in all the fitting threads on the sight glass, I used silicone caulking sealant. This was suggested to me by Bob Osterhout of Rio Pecos several years back. It works as a sealant even under the severe heat of a banjo fitting inside a smoke box, and is a Godsend for sealing all steam piping. The filler opening is the same 'wide mouth' filler as on my Pearse Consolidation and 2-4-4-2 logging articulated. With a widemouth filler you hardly need a funnel.

The day of reckoning had arrived. My employer's test lab has a hydro testing device that uses air over water to test vessels. I quaked with fear for my silver soldered joints as the pressure increased. Oh no! A dribble from the sight glass! Tighten that thing down, and continue. 40-50 PSI, I have my proposed operating pressure, now will it hold for 200% operating pressure? Slowly I approached 100 PSI. Not a drop of water! It took two 'practice boilers', but my working 'tee' boiler, the most difficult ever for me to build, was functional. I couldn't wait for the steam test.

The boiler has an 8-32 threaded insert at the bottom of the 'tee' section that serves as the locator and rear mount to the locomotive frame. The screw is strong enough and the boiler light enough that this mount alone can hold the boiler for testing. The first steam test was done using the gas tank from my steam streetcar since the one for the Shay had not yet been built. A makeshift fuel line was hooked up and the boiler filled with water. The burner lit from the stack the first time. The sound of that pop was beautiful. The fire immediately



...and the rear view.



Detail shot showing brake rigging, tool box, and front sander lever.

drew back into the flue. The burner exhibited its Ruby heritage by emitting a loud whistle during steamup. 40PSI was reached in less than 5 minutes. So far, so good.

I took off the smokebox front to examine the fire. At high gas flow rates, the flame was into the smokebox. I knew from the whistling of the fire I had to put mesh over the burner, and I hoped that mesh would reduce the smokebox fire, too.

After putting stainless steel mesh over the burner, I installed the Graham Shay 1 engine onto the chassis. This engine was at one time in my Geoffbilt Shay but was removed due to severe wear problems. I had played with it for several hours trying to overcome the main bearing and eccentric follower wear and its effects on valve timing. I got it to work by adjusting the linkage so the "D" valve travel, including linkage play, was centered over the ports, and it ran quite nicely. I knew that replacement parts and changes in metallurgy were coming soon, but as they say at the end of Conan movies, 'That again is another story'.

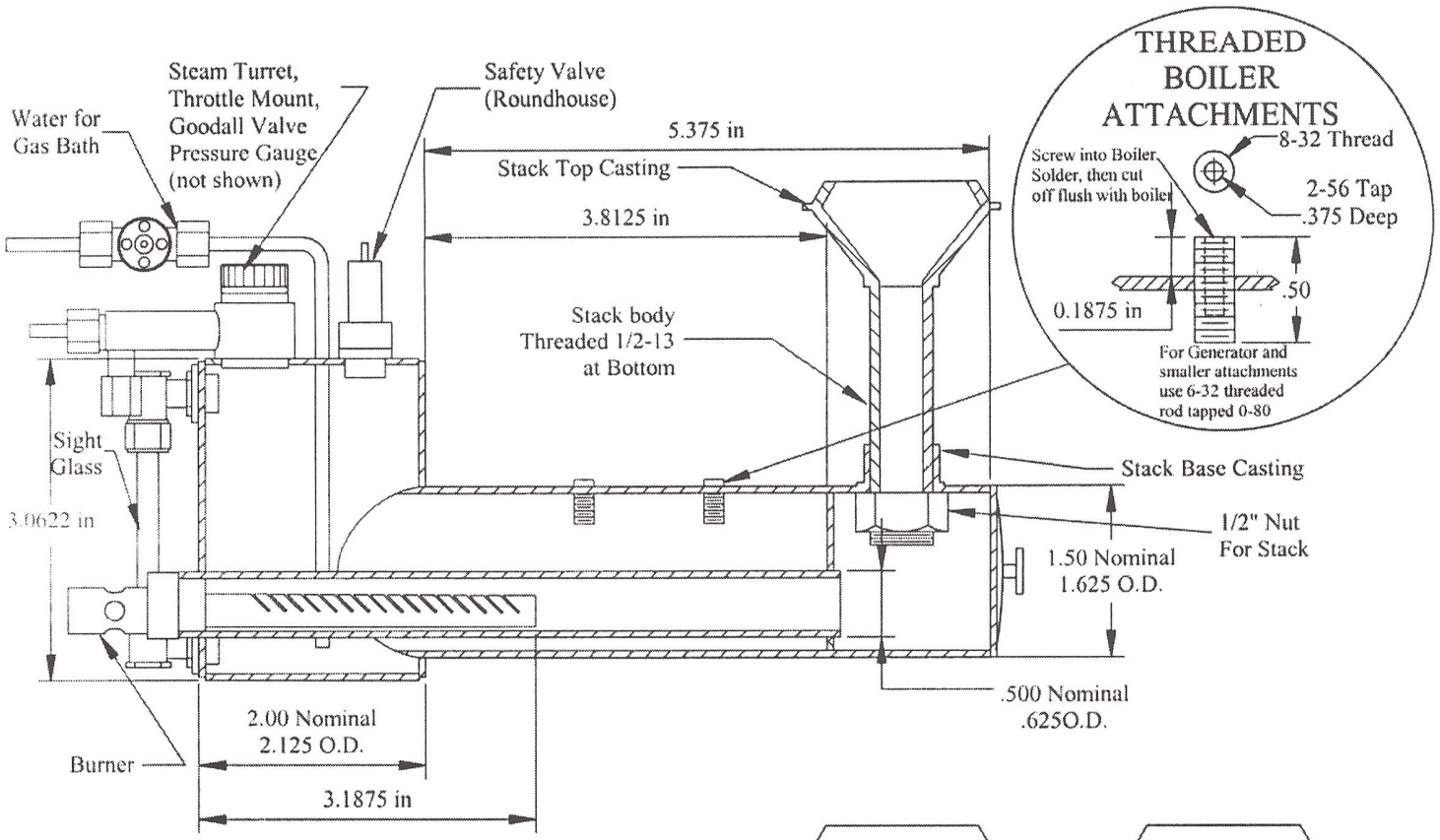
The lubricator and throttle hookup were set up for this engine by design, so hookup was simple. I could now run the Shay on my bench for the first time. I fired up the boiler, waited for about 30 PSI to build, then cracked the throttle. After a bit of priming, which is to be expected, the locomotive came to life and ran quite well. Remember at this time the Graham Shay 1 still has worn parts in it and cannot be timed perfectly.

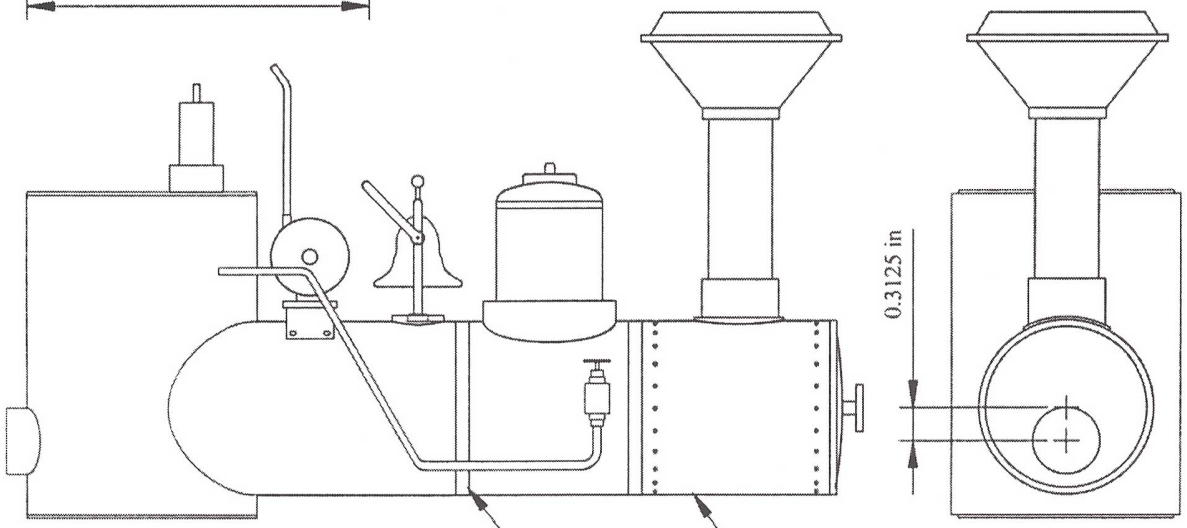
I built and tested the boiler during the cold Illinois winter, so running or testing outdoors is not always practical. I set up my temporary indoor track and practiced the hobby of 'Steam in the Garage' (a new magazine maybe?). With safety set at 40 PSI, and a short point-to-point run. The Shay could pull as many cars as I set down. Now to build a gas tank with water bath and install the R/C to better put this fledgling locomotive through its paces.

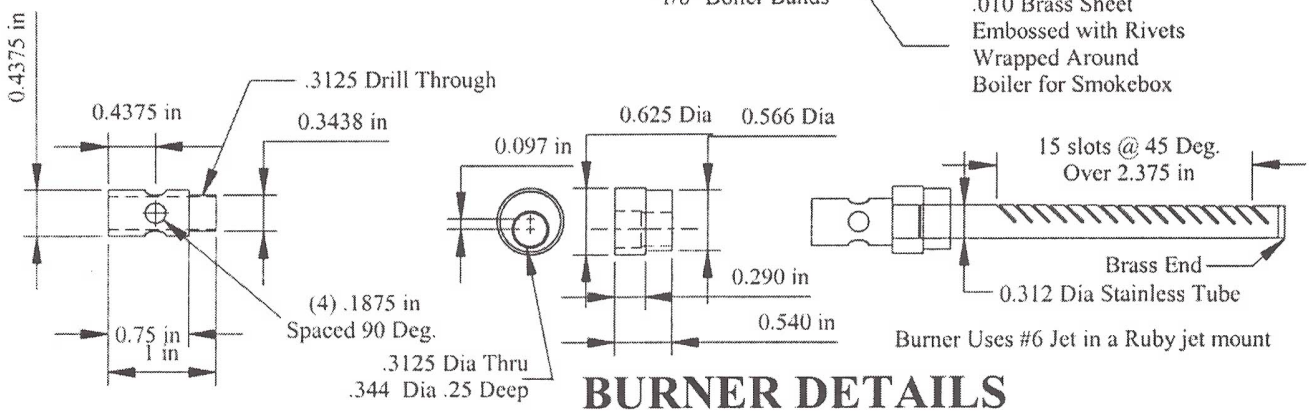
My gas tank and its water bath are an integral assembly. The ends of the tank are .060" brass plate silver soldered to the tank body. They are square and are the ends of the gas tank and the ends of the water bath as well.

The gas filler assembly is the top portion of an old Ruby gas tank soldered to the top of the new tank. This contains the bushing for the filler valve, a top for expansion, and the gas regulator valve. A small lever attached to the regulator valve is on the front of the bunker. It is hardly noticeable. Using these Ruby parts

"TEE" BOILER DETAILS







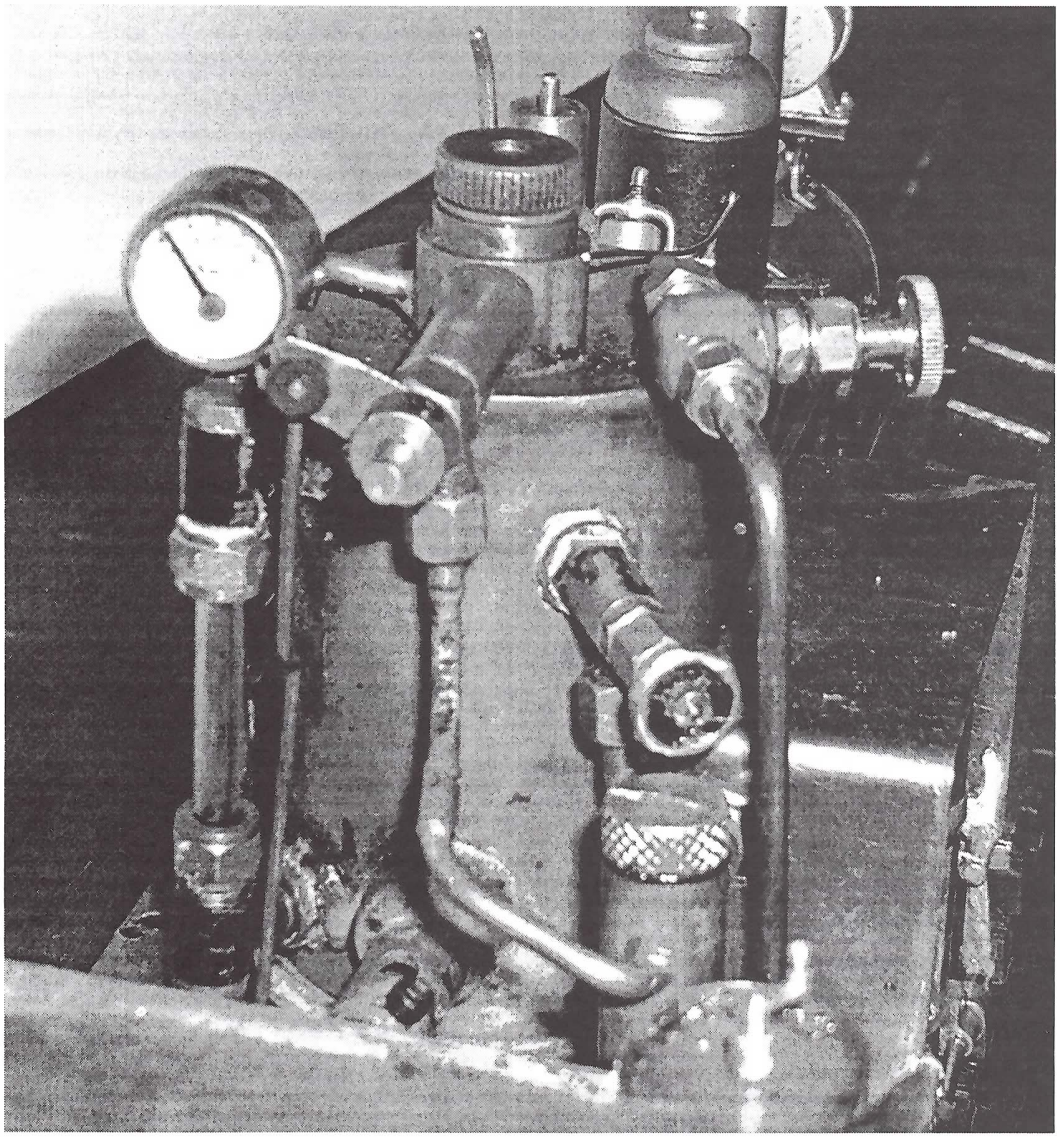
BURNER DETAILS

made gas tank construction so much easier. I think Accucraft sells the tanks as a separate item, so others could build a tank in the same way.

The gas bath has a drain that empties cold water onto the ground, and is fed via a valve that takes hot water from the bottom of the boiler. There is an overflow pipe built into the tank so that excess water cannot spill over into the R/C receiver and other electrical components. The bunker completely covers the gas tank and bath, so filling the bath from the boiler is a blind operation. This is no difficulty with the overflow system. Filling the gas tank is accomplished through the water hatch at the top of the bunker.

This locomotive was built 'from the ground up' for radio control. The receiver batteries had been fit into the bunker using CAD before any of the bunker parts were built. The servos were carefully fit into the underside of the locomotive frame using CAD before the frame was ever built. What I had not counted on was the heat buildup on the underside of the frame due to the firebox being directly over the direction servo. This was remedied by using 1/8" sheet insulation (available from McMaster-Carr) between the boiler bottom and frame, and multiple layers of the same insulation between the underside of the frame and the servos.

Futaba S3101 miniature servos are the only ones I have found capable of withstanding a high temperature environment. Don't use any others close to heat sources. Initial testing without the insulation showed



Closeup look at the backhead plumbing on the "Tee" boiler.

the electronics would not respond properly at the elevated temperatures. This led to the stripping of some gears in the servos. The gears did not melt in the heat, they were over-driven because the heat affected servo circuitry did not know when to shut the servo motor off.

Some insulation, a 'cool head' inside the servo, and all is well. Futaba S3101 servos have a gear replacement kit that sells for about $6.00. A whole lot better than the $35.00 required to replace the servo. Spare parts - another reason to use these servos.

I used a 'servo saver' with the engine reverser servo. Running a servo against a solid stop such as Stephenson's reversing gear will soon wear out the servo's gearing, and may interfere with the proper operation of the reversing gear. A servo saver is a spring loaded device used by R/C plane modelers to cushion impact on servo controlled landing gear, thereby avoiding servo gear and motor damage. This device can be used for short throw applications like reversing Stephenson's valve gear on a Shay. If some overtravel is designed into the linkage, the servo saver assures full reversing lever travel and protects the servo gearing from jamming against a rigid stop. This doesn't seem to be needed with throttle linkage since the throttle close can be adjusted so there is never overshoot, and throttle full open needs no positive stop.

I now had a boiler, firing system, trucks, gearing and frame, as well as radio control hooked up. I could now functionally test the locomotive. Every time I do this with a new locomotive I am reminded that just because all the individual parts function and fit together there is no guarantee of a satisfactory locomotive. As with all my other projects, changes had to be made.

I ran the chassis forward and back on my bench many times. I set up point to point track in my garage and did pulling tests and general running, and the locomotive ran well. When the weather warmed, I was able to run on the outdoor track. This was truly the ultimate test. Two major shortcomings were found. The first was that the flue fire was still entering the smoke box at high flame. I found this out the hard way. During a run with a nice size logging train in tow, the Shay suddenly stopped and would not run in either direction. I found that the smokebox fire had gotten so hot that excess heat had melted the soldered joints on the front truck frames!

As it turned out, correcting this actually improved boiler performance. To reduce the flame, I rolled up a 2" long piece of stainless mesh and put it in the flue ahead of the burner. Not only did this eliminate the smokebox fire, it now acts as a radiant heat element spreading heat to the front of the flue and improving boiler recovery. The other problem is water consumption. I can make 2 circuits around my back yard before adding water as opposed to twice as many for the Geoffbilt Shay. This cannot be changed without a larger boiler, and I want to keep my skinny one. The locomotive just looks too good with that scale 33" boiler on it. I simply carry the water bottle and use the Goodall. On the up side, the boiler recovery is fast so I can fill the boiler from about half full (one time around the yard) and almost instantly pull away. With a hot boiler, recovery to an operating pressure of 20 PSI is less than a minute. 20 PSI is normal running and is plenty for those big .500" bore cylinders. By the time the locomotive is half way around the yard, the blowoff pressure of 30-35 PSI has been reached. This little boiler can at times actually 'gain' on the engine.

I have also run the boiler with no mesh whatsoever in it and, although recovery is somewhat reduced, the boiler lights much easier. With timing and sealing efficiencies in the Graham engine (another story), less steam is consumed and firing never again reached the level where truck parts become unsoldered. I have also stretched the run to three times around the yard, all going well.

One unrelated little problem involved a persistent pinhole leak at the bottom of the lower sight glass bushing, where it solders to the boiler. Rather than disassemble everything and silver solder this, I cleaned the surrounding surface and put on a dab of JB Quick, available at many hardware stores. It mixes like a two part epoxy and is heat resistant. The leak has not returned.

With the locomotive operational and structurally complete, I could now concentrate on some detailing. No cab or bunker had been built yet, but the boiler, frame, and trucks could be detailed.

The boiler has the usual piping found on a Shay of this size and vintage. Remember I am not faithfully modeling a specific Shay (although #495 is close), but I am attempting to faithfully model Shay building PRACTICE.

The boiler details are all from Trackside Details. These include bell (TD 41), generator (TD 170), generator bracket (TD 136), headlight (TD 153x), headlight bracket (TD-106), check valves (TD 132), Dome base (TD 169), Dome top (TD 186), sand dome top (TD 188), Diamond stack top (TD 189), stack base (TD 168), smokebox front (TD 185), and number plate (TD 72). Half of the detailing castings used on this

model are on the boiler. Add the piping for sand delivery, water injection, and actuators for sanders and bell and you wind up with a pretty busy looking boiler, just what you want on a Shay.

My detailing work included several very informative conversations with Pete Thorpe of Trackside Details, who set me straight on a number of Shay detailing issues. One interesting area is the sanding system. The front truck of a Shay received its sand in the usual way, through a dome on top of the boiler. The rear truck often got its sand from a sand 'box' at the rear behind the fuel bunker. I had a couple of sanding valve castings which usually mount at the bottom of the sand dome and out of which come the sanding pipes. I read Pete's instructions for these and found they needed steam lines to them to actuate. This was good because it's more nice, busy, piping to run. I didn't see these on any 1895 vintage Shay and asked Pete about it. Turns out that a small lever actuating a 'shaker' inside the domes was all the early Shays had. The sand pipe for all practical purposes just came out of the dome and ran to the trucks. This is simplistic, but it is true to the practice of the day, so that is the way I did it. So it is with all aspects of this model.

There have been a number of letters written to *Steam in the Garden* and to me about my first Shay article, all of them favorable. I want to thank all of the readers who wrote...keep those cards and letters (and e-mails) comin'. I have also been asked via e-mail for more detailed plans and drawings as well as construction advice. I can provide all this, time and resources permitting. If you want to contact me about Shay construction, please e-mail at Steamrocks@AOL.com.

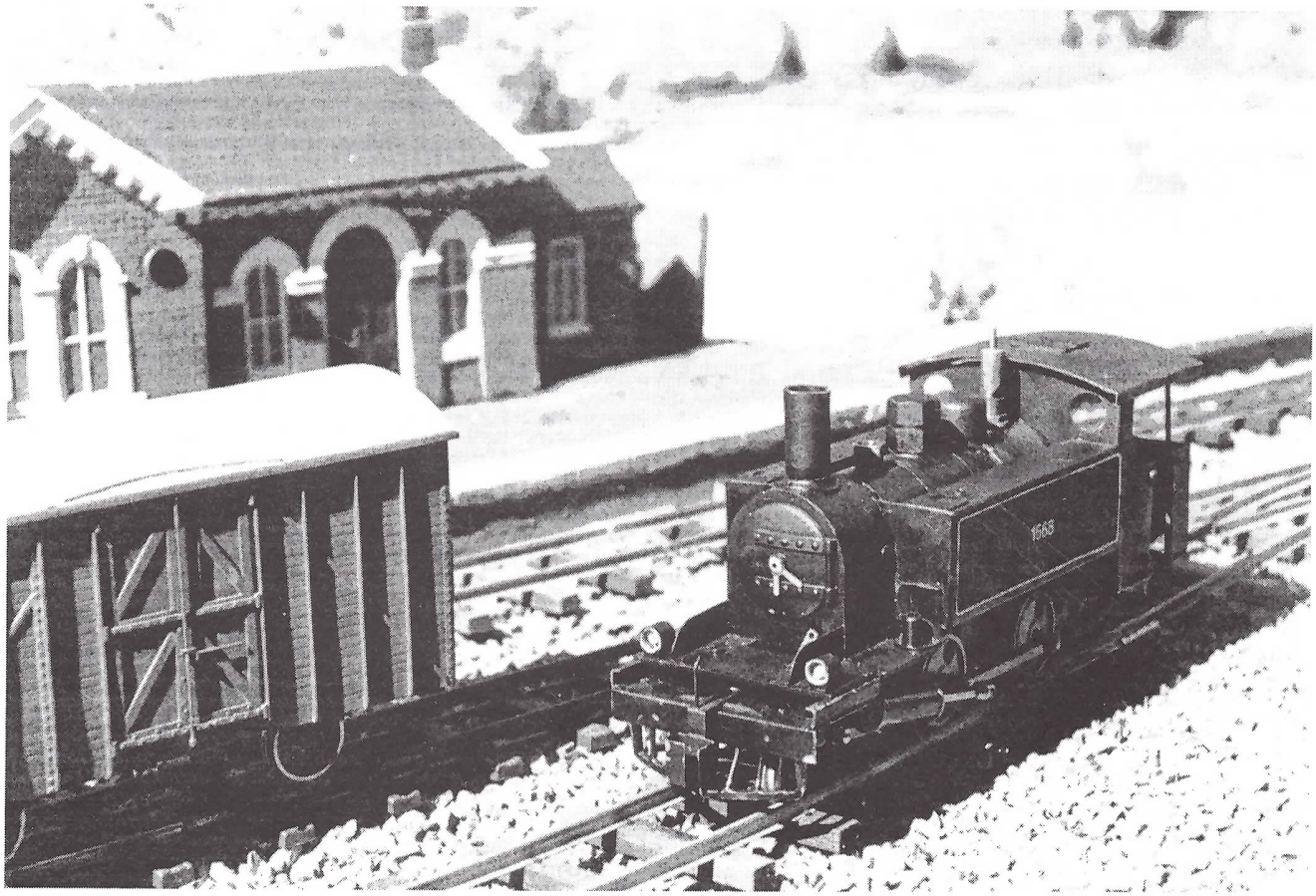
In Episode III, "Return of the Graham Shay 1", I'll tell about how, with the help of Gail Graham, I was able to return a beautiful looking but badly wearing Shay engine to full operation and cope with some of the wear problems the Shay 1 kits had. I'll also describe the sheet metal work for cab and bunker, as well as how I got 'ten pounds of rock in a five pound bag' with all the accessories in the bunker.

Workshop Project

A Simple Sprung Pony Truck

text, photos and drawings by Peter Watson

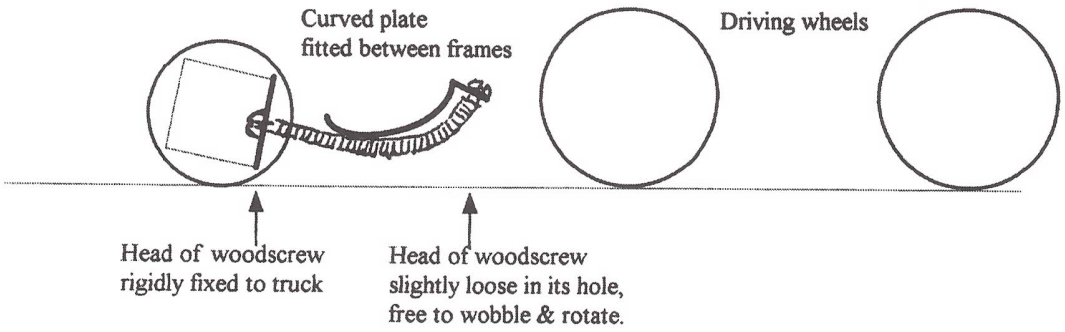
Keep 'em on the track!



The 2-4-0 Mamod at work in Oatlands station yard on the author's 1:32 scale O gauge layout. The beautifully detailed 4-wheel Western Australian Government Railways van is by John Gaspari of Albany, Washington.

Converting an 0-4-0 wheel arrangement to 2-4-0 and adding a leading pony truck can nicely enhance a loco's appearance, but it can also affect its running qualities. In any derailment it is usually the leading pony truck that derails. Adding weight to the truck to improve its track-holding can help a little, but only a little.

When running at speed even a heavy truck will jump and bounce on track rough spots. By far the best remedy is for the truck to be sprung, because effective springing keeps the wheels always in contact with the track. The design of springing on real locos is com-



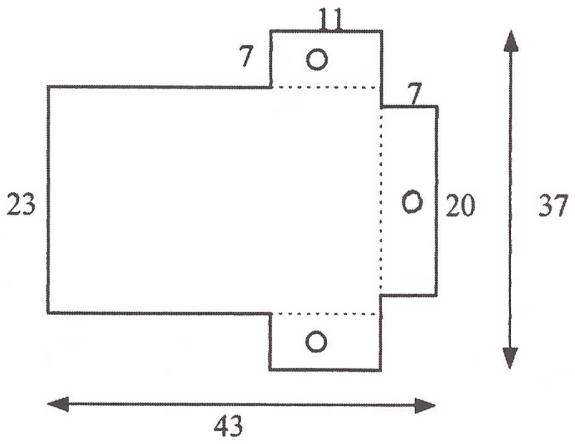
plex, relying on the springs being matched to the actual dynamic forces of the loco, difficult for even the most expert modeller.

Here is a non-prototypical alternative design for a fully sprung 2-wheel leading pony truck that achieves the same result and is almost ridiculously simple in principle. It' s easy to make, and it works fine in practice. The illustrations show an 0 gauge Mamod converted to 2-4-0, but a similar conversion could be applied equally well to almost any 0-4-0 loco, such as a Bantam, Ruby, Iver, Jane and the like.

One end of a length of coil curtain wire is flexibly attached to a fixed point between the loco frames, while the other end is rigidly attached to the pony truck. When the loco is on the track, a fitting between the forward underframes presses down on the middle of the curtain wire, bowing the wire downwards and thus pressing the pony truck wheels on to the track.

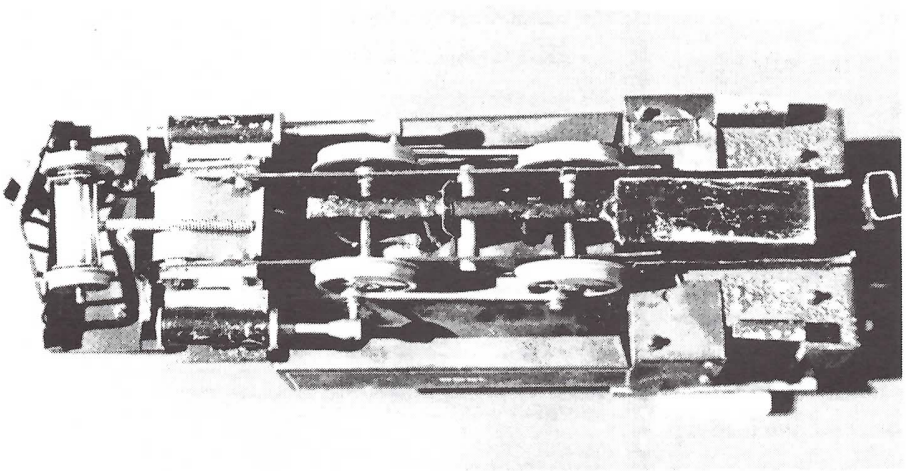
The drawings and photos are largely self-explanatory. The screws at either end of the coil curtain wire are small, slender, round-headed, brass tapered woodscrews which screw directly into the open ends of the coil. The woodscrew attached to the loco is deliberately slightly loose in its hole, allowing it to rotate and wobble, but at the pony-truck end the head of the screw is soldered on, thus keeping the axle at right angles to the wire.

For the Mamod, a single fitting (see diagrams) suffices to both bear down on the wire and to provide an attachment point. The fitting is held inside the forward underframes by the existing bolts that hold the cylinder rubbing plates. It has a smooth surface that can slide sideways on the wire as the loco enters a curve and which keeps the wire from fouling the springs and pipes above it. One diagram shows the dimensions of this easily-constructed fitting. Bend the tabs downward after first drilling the holes. The hole in the end tab is drilled to fit the woodscrew. The holes in the side tabs are drilled to fit the lower rear nuts that hold the cylinder assemblies to the frames. (Later Mamods used pop-rivets instead of nuts and bolts. Drill out the relevant pop-rivets and replace with 1/8 inch nuts and bolts.) I used light brass sheet but a tin can would do.



Attachment fitting for Mamod pony truck.
Dimensions in millimeters.
Material: light brass sheet.
Tabs fold downward, main surface curves upward as shown in the photo.

I remodelled this particular Mamod to 1:32 scale for 0 gauge, a freelance 2-4-0 with a character that might be described as Baldwin with British-colonial overtones such as ran on 3' 6" light railways in Tasmania, New Zealand and elsewhere. As a collector of old toy steamers I normally believe in leaving things in original unaltered condition, but it was easy to ignore

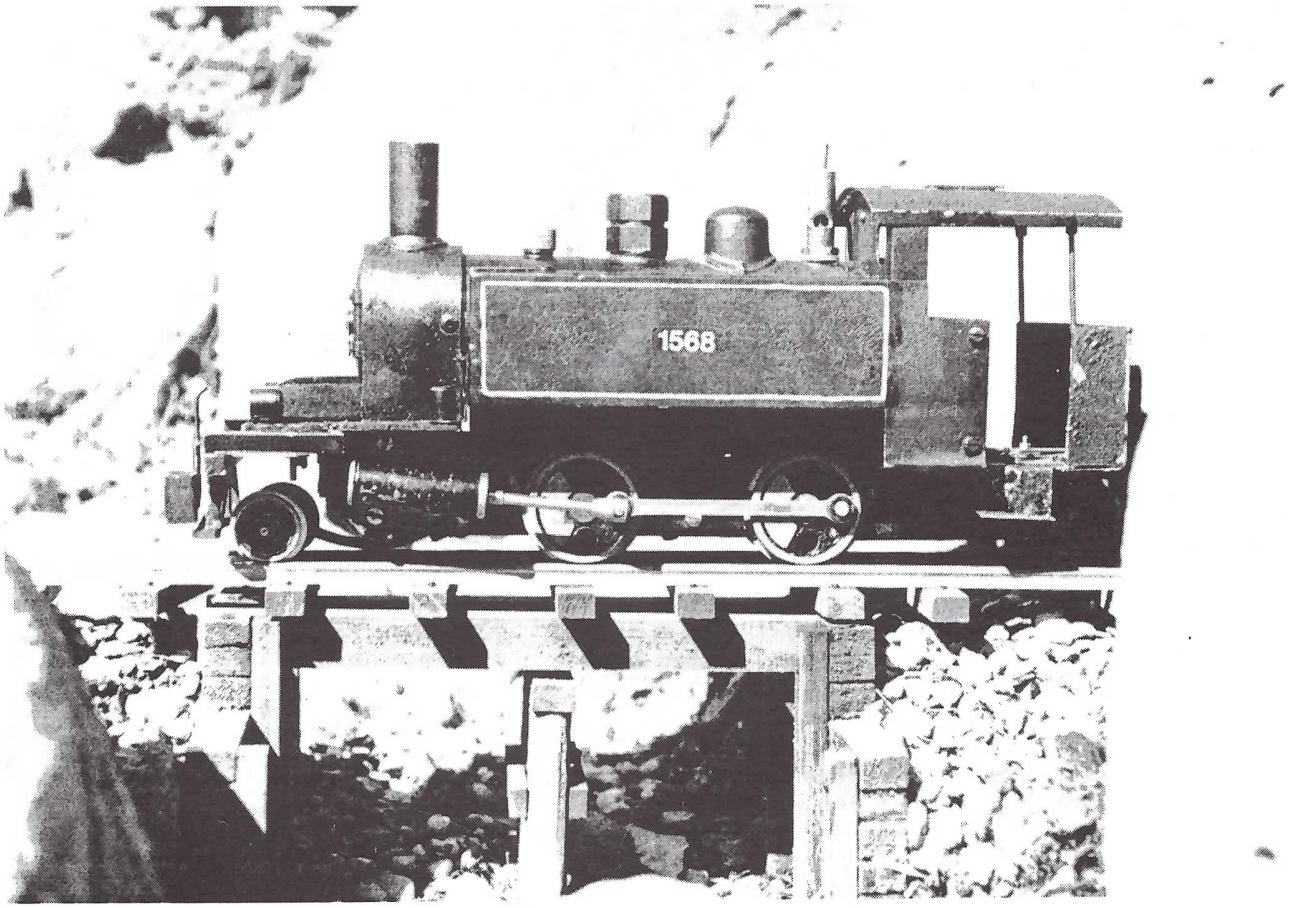


Underneath view showing the arrangement and fitting of the pony truck.

such scruples here.

The poor Mamod appeared to have been fitted with radio control by a previous owner using very large tinsnips, followed by more damage on removal. It was a wreck, a true renovator's 'opportunity'. I extended the area in front of the smokebox to make room for the pony truck, cutting and filing away part of the original front buffer-beam and adjacent underframe. Other alterations included lowering and lengthening the cab and shortening the chimney.

Tbe original Mamod steam dome was too tall, but it shrouded a hexagonal hollow nut inside which is the real functioning steam offtake and which therefore had to stay. After a vain search for a substitute shroud I decided the bare hex nut looked acceptable enough as it was, amongst the other assorted hardware atop the boiler. I kept the whistle (minus its lever), not for its pusillanimous high-pitched hiss but rather as a pressure-relief device, useful when running these simple pot-boilers. A spirit burner was fitted and the Mamod safety valve replaced



The coil curtain wire and the curved attachment fitting are just visible beneath the cylinder.

by a Mike Chaney valve.

Overall, the conversion resulted in a very pleasing loco. Inexpensive, good looking (the low-angle side shot not being a flattering view, it must be said!), one-of-a-kind, and a reliable and trouble-free runner. The front pony truck rarely–if ever–derails. Although the pony truck carries a relatively minor portion of the engine's weight, it does bear down quite firmly on the track, firmly enough to switch a train-actuated turnout on my layout. It has to be travelling quite slowly for this to work but the maneuver is hardly even worth attempting with other locos of mine that have leading pony trucks.

Since altering the Mamod, my metalworking skills have been upgraded through evening classes at a local tech college, and currently an IP Engineering 'Jane' is in the workshops for a similar conversion job from 16mm/ft 0-4-0 to 1:32 scale 2-4-0.

L. M. S. Period Piece...

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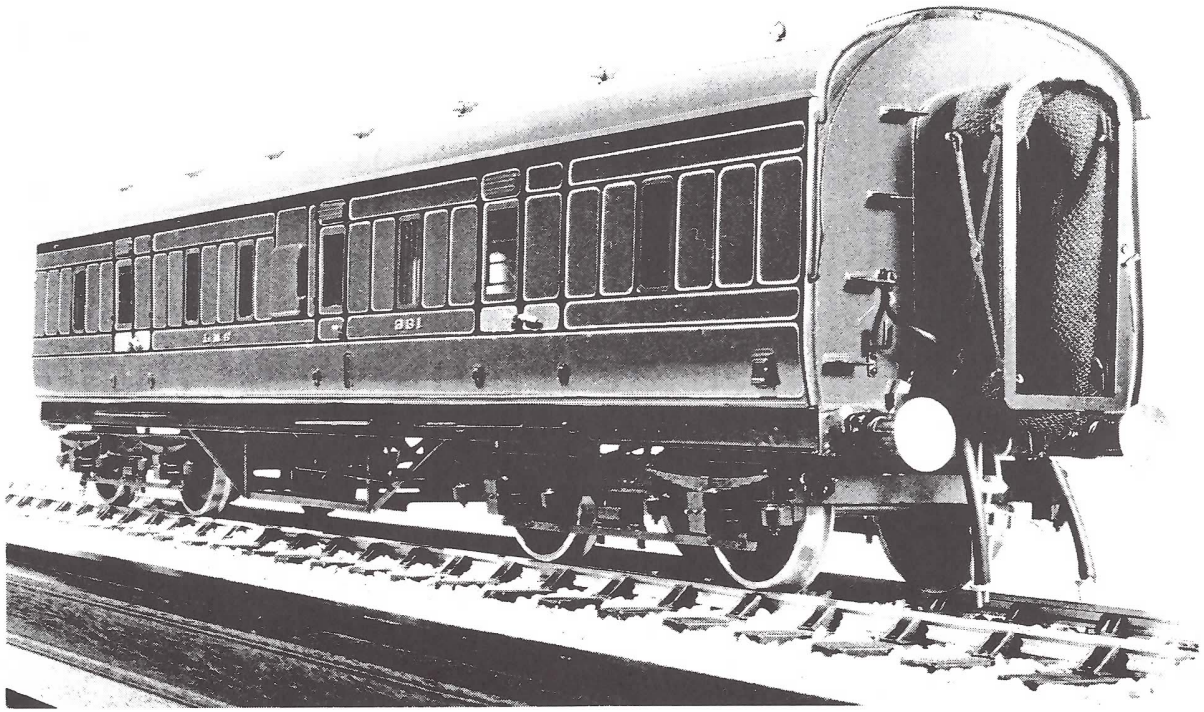

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END OF THE LINE

Thanks!

Thanks to all of you who responded with your very positive support of our price increase announced in the last issue. Not a single dissenting opinion was received. We appreciate it!

As soon as the FEDEX truck disappears down the highway, carrying this issue to our printer in Kansas, Faithful Assistant and I will be switching hats to get everything shipshape for our annual summer steamup here at Paradise East. Our plan to add a dual-gauge mainline loop has been put on hold for now, as our friend Tom Bowdler will be bringing a portable track of his own design and construction down to supplement our elevated PETS track. We're looking forward to a good time and hoping that the weather will cooperate!

Speaking of steamup tracks...we get a lot of requests from our readers for more articles and info on building a track especially for operating steam trains. At least two of our regular contributors, Tom Bowdler and Chuck Walters, have promised to share their designs and construction techniques with us in future issues. You can see a photo of Chuck's excellent elevated track at the end of his Beginner's Guide article in this issue.

Go out and boil some water, and if you see us coming down the track at a steamup somewhere, give us a blast on the whistle!

Happy steaming,

Ron

Coming in our next issue:

- **loco review of the Accucraft Shay**
- **steamup reports from around the world**
- **workshop projects**
- **and lots more!**

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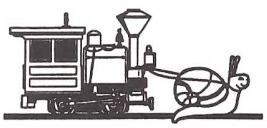

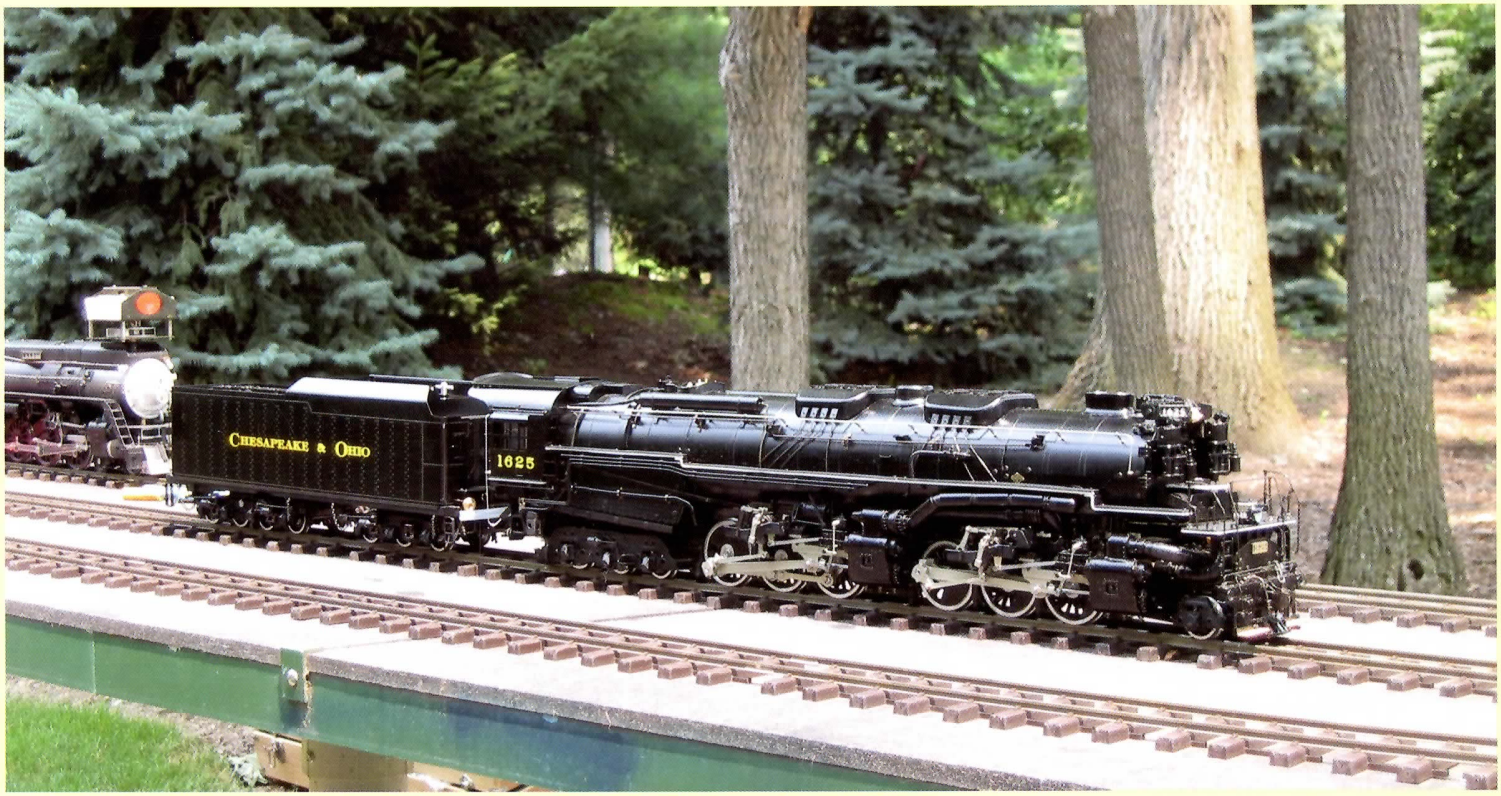

Top: Huge and magnificent, an Aster Allegheny rumbles past the line of steam engines waiting at the water tank on Robert Hekemian's beautiful elevated line in New Jersey.

photo by Robert McHale

Center left: Quentin Johnson's City of New York, seen on display at the South Orange Seaport steamboats only regatta in New Jersey.

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Bottom left: Joseph Hanulec's Coast Guard cutter at speed!

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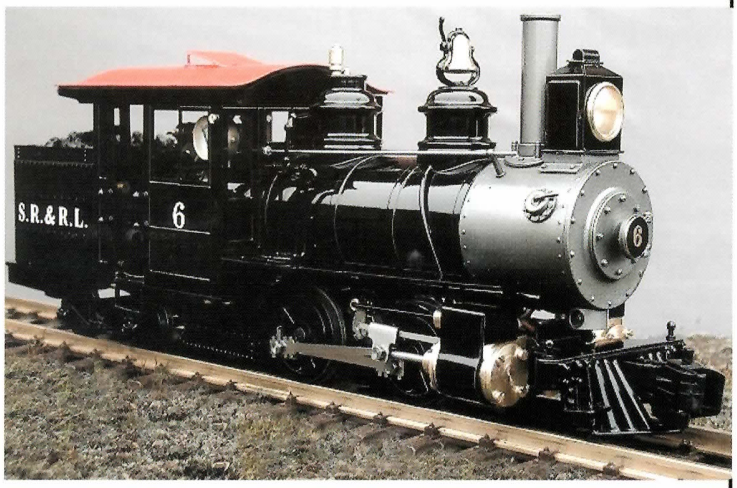

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