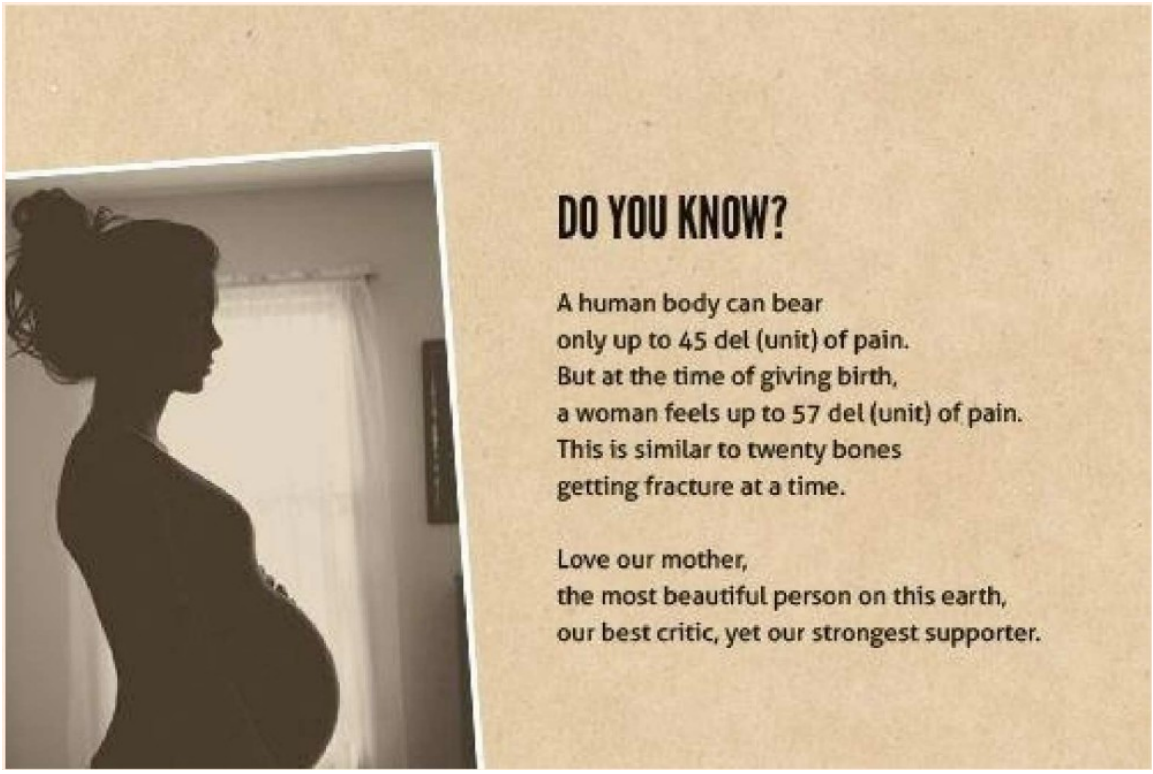

To those that are many times overlooked, Happy Mothers Day

The CallBoy

May 2024

Pat Young CallBoy Editor
10349 Glencoe Drive
Cupertino, California, USA
95014

The CallBoy Newsletter

Official Publication of the Golden Gate Live Steamers, Inc.
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Tilden Park 2491 Grizzly Peak Blvd, Orinda, California USA 94563	Pat Young, Editor phty95014@yahoo.com **May 2024**	A 501(c)(3) Non-Profit Corporation www.ggls.org or www.goldengatels.org

Board Officers

President:	Jon Sargent	510-233-6481
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Secretary:	Matt Petach	408-256-2883
Treasurer:	John Lisherness	510-647-8443
Safety:	Jerry Kimberlin	510-809-7326
Director at Large:	Sammy Tamez	510-706-5614
Past President:	Rick Reaves	510-479-3386

Ombudsperson

Lisa Kimberlin 510-214-2595

GGLS Trust Fund Members

John Lisherness
Jerry Kimberlin (elected March 2015)
Sammy Tamez (elected August 2022)

GGLS Committee Chair People

Bits & Pieces:	Jeremy Coombes
Boiler Testing:	Jerry Kimberlin
Building:	Rick Reaves
CallBoy Editor:	Pat Young
Dues:	Lisa Kimberlin
Grounds:	Andy Weber
Landscape:	Jo Ann Miller, Bruce Anderson
Librarian:	Pat Young
Locomotive:	Paul Hirsh
Membership:	Sammy Tamez
Public Train:	Walt Oellerich
Refreshments:	Walt Oellerich
Rolling Stock:	Rich Croll
Security:	Jon Sargent
Shop Foreman:	Rich Croll
Signals:	John Davis
Technical Talks:	Charlie Reiter
Track:	Jim McKibbin
Train Storage Rental:	Jon Sargent
Web Site:	Pat Young

Club Correspondence

All correspondence to the Golden Gate Live Steamers should be sent to the secretary, Matt Petach at this email: secretary@ggls.org

Membership

To qualify for membership, attend 2 monthly meetings. At the first meeting, please introduce yourself and obtain a membership application from the Membership chairman or Secretary. At the second meeting, return your completed application, a signed release form, the yearly prorated club dues, together with the $25 initiation fee and you are officially a member.

CallBoy

Articles, pictures, photographs, items for sale or any other information that would be of interest to the club should be sent to Pat Young, the CallBoy editor at phty95014@yahoo.com

Deadline for submittals to next month's issue is the 19th!

2024 Calendar of Club Sponsored Events

05/05 General Meeting/Board Meeting
05/10 Club reserved for Jon Sargent
05/18 BAEM meeting

06/01 Club reserved for Shanna O'Hare
06/01 Redwood Valley Railway event
06/02 Redwood Valley Railway event
06/08 BAEM meeting
06/09 General Meeting/Board Meeting
06/15 GGLS Spring Meet
06/16 GGLS Spring Meet & Open House
06/22 PV&A, SVLS, GGLS joint meet at PV&A
06/23 PV&A, SVLS, GGLS joint meet at PV&A
07/14 General Meeting/Board Meeting
07/20 BAEM meeting

08/11 General Meeting/Board Meeting
08/17 BAEM meeting
08/24 Club reserved for Sammy Tamez

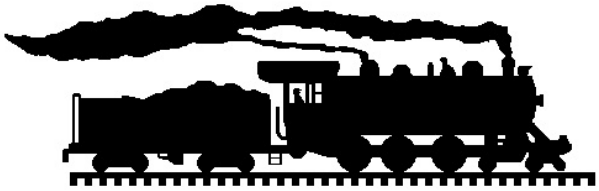
09/08 General Meeting/Board Meeting
09/14 GGLS Fall Meet
09/15 GGLS Fall Meet & Open House
09/21 BAEM meeting
09/28 Club reserved for John Smith

10/13 General Meeting/Board Meeting
10/19 BAEM meeting

11/10 General Meeting/Board Meeting
11/16 BAEM meeting

12/08 General Meeting/Annual Meeting/Board Meeting
12/14 BAEM meeting

Announcements



June 15th and 16th will be our Spring Meet and Open House. We'd like to provide lunch for our volunteers on Saturday so we need lots of people to come out and help with setting everything up, guiding people around, and cleaning up at the end of the weekend.
If you have trains that you can bring out, please set them up in on the display tracks in the steaming bay area so the Public can see them and run them around the track if you can.
Brian Perry & Jim Pate will be here to provide overnight security for the trains and for those who want to do night runs, Friday & Saturday nights are the only days we're allowed to run trains after dark. But if you do run after dark, please don't blast your horn or whistle so we don't wake Jeff up in the trailer down at the corporate yard.

June 23rd & 24th is the Joint Meet with the Portola Valley & Alpine Railroad, the Golden Gate Live Steamers and the Sacramento Valley Live Steamers in Portola Valley, California. More information and directions can be obtained from our secretary.

Big Boy No. 4014's Westward Bound Tour Coming this Summer!
Union Pacific's famed Big Boy No. 4014, the world's largest operating steam locomotive, will return to the rails this summer with a scenic tour across mountain ranges and high desert vistas in four western states: Wyoming, Utah, Nevada and California.

Big Boy will journey from its home base in Cheyenne, Wyoming on Sunday, June 30, en-route to Roseville, California, before returning to Wyoming by the end of July. It will make numerous whistle-stops in communities along the way, with public display stops scheduled in:

July 12-13: Roseville, California
July 20-21: Ogden, Utah

Additional route details and approximate times for whistle stops will be shared closer to the tour. A route map can be found at www.Upsteam.com.

During the tour, the Union Pacific Museum will host a special passenger trip. The unique experience is the annual gala fundraiser for the nonprofit organization and provides a rare opportunity to travel on this historic heritage equipment. More information on the specifics will appear at www.UPtrainTix.com when they become available.

This is one of two public tours planned for Big Boy in 2024, with a second tour planned later this fall with stops in Texas, Arkansas, Kansas, and Illinois, among other states. Details of the second tour will be released later this spring.

The month-long "Westward Bound" tour will honor Union Pacific's rich railroad legacy and celebrate the railroad's employees and communities it serves.

For part of its journey, the Big Boy's consist will include an assortment of rail cars giving spectators a glimpse into what the locomotive looked like pulling freight in its heyday.

"The Big Boy locomotive symbolizes the pivotal role railroads played in shaping our nation's history, and the technological advances we have witnessed within our industry," said Union Pacific CEO Jim Vena. "We are thrilled to share this living piece of history with our employees and the public, and we love seeing the enthusiasm this locomotive generates wherever its whistle blows."

To join the Union Pacific Steam Club go to:
https://www.up.com/heritage/steam/

If you head over to see it, please wear your GGLS apparel to show your club pride!

Our May meeting is a week early on May 5th, 2024 to avoid conflicting with Mother's day. So remember to update your calendar with our new General meeting date and MOTHER'S day.

New Members and Guests

Michael Rodrigues, friend of Bill Hanna, came to see what the club is about and hasn't committed to being a member yet. But if you see him, give him a GGLS "Hi"

Brooke Murphy, daughter of GGLS member Dee Murphy, talked about her personal experience at Roots of Motive Power in Wilitts, California. Makes me want to join the fun.

Other people who attended also included Jesse Palmer, returning to become a member and Pat Young's wife, Carolyn, who was present but not really considered a guest.

Railroading Activities

Bruce Anderson went to Hiller Aviation Museum in San Carlos, California, and saw the exhibit "Trains and Planes" which had four train layouts in Lionel O scale, G scale garden railway, HO scale and one other.
More information can be found on their web site at https://www.hiller.org/

Rebecca & Rahim Pereira went to Roaring Camp & Big Trees in Santa Cruz, California to ride the train and then went to the Niles Depot Museum in Fremont, California, which has a large HO scale railroad. They even let Rahim start working there and if you want more information go to their web site at https://www.nilesdepotmuseum.org/home

Matthew went to Arkansas this past weekend with his brother to see the solar eclipse. They then went through Fort Smith, Arkansas and saw the vintage 1920s street cars and the Fort Smith Trolley Museum has a nice shop set up in an old Coca-Cola building.
More information can be found at:
https://www.fstm.org/

Dee Murphy and daughters Brooke & Sierra went to Willits, California last weekend to the Roots of Motive Power steam school and learned to operate the Keystone steam well driller, the Ohio steam crane and the Buffalo Springfield steam roller. Matt Petach was also there for the weekend and got to operate the Buffalo Springfield steam roller as well as the Port Olympia #2 (a 2-6-2 prairie locomotive) first as fireman for several trips and then as engineer for several trips.
There is a steam shovel class coming up on July 20th & 21st and more information can be found at: https://rootsofmotivepower.com/

Matt also talked about taking a trip up to Corvallis, Oregon for WinterRail, an amazing day & a half of railroad photography, video storytelling, swap meet and just all-around great railroad fun. More information can be found at:
http://www.winterail.com/

Minutes of the General Meeting

Officers Present: Matt Petach, Jerry Kimberlin, Jon Sargent, Rick Reaves, Sammy Tamez. Lisa Kimberlin was present as Ombudsperson, Rich Croll was excused this month and John Lisherness was absent when the meeting started.

President Jon Sargent called the meeting to order at 1004 hours Pacific time.

Officer Reports:

President: Nothing to report.

Vice President: Nothing to report.

Secretary: Matt was too busy gallivanting around at train activities to get the mobile payments set up this month. Bad Matt!

Treasurer: The Treasurer assured us our club finances are in good shape.

Ombudsperson: Nothing to report.

Safety: Jon Sargent asked Jerry Kimberlin if we should go back to wearing red Safety Committee caps?

Director-at-Large: Sammy Tamez has the signs for the Spring Open house from John Smith.

Committee Reports

Buildings: Nothing to report.

Grounds: Andy Weber is celebrating his 75th birthday today!

Ground Track: Jim McKibbin is building a causeway under the trestle to get the lower track up out of the standing water.

High Track: The Club is still looking for a chair person.

Signals: John Davis said switch going into the station will be replaced this summer.

Locomotives: Paul says locos are doing well. Sammy asked about the next series of training classes and Paul answered that he is waiting to finish Heinz locomotive first. The classes themselves will be interactive sessions, not “training” classes.

Rolling Stock: Absence.

Shop: Absence.

Public Train: Walt will be spraying weeds now that rains are done for the year. Please bring your equipment out for display during the Spring Meet's Open House on Sunday as well as the Meet on Saturday.

Landscape:

Jo Ann Miller & Bruce Anderson are working on Heinz loop area using some donated artificial turf from Paul Hirsh. Our buildings can use more tender love like John’s neighbor Elizabeth did for the little red house. Rick Reaves has bought the livery stable to his home to be repainted and Simon Maude is working on the bank.

On a different note Becky Pereira's dad was a carpenter and she would like to donate his tools to the club.

Round House & Storage: Nothing to report.

Security: Everything working as expected.

Membership: Sonia Iron Cloud & Charlie Murray need badges and Jesse Palmer has completed his membership form.

CallBoy: If you haven't got your CallBoy electronic or printed, please contact editor Pat Young. And as a reminder that past issue can be download from the www.ggls.org website.

Note: If you know of a valid email address to the secretary of the Los Angeles Live Steamers, editor Pat Young would like to send their club a copy of this newsletter.

Website: Pat Young is still finishing up his computer migration of our club website and will run DRLink to check for any broken links within it.

Library: Pat has brought free, duplicate issues of magazines to the swap meet. Please take some!

Builders Group: Pat Young wanted to thank Bruce for his articles on Harley engine and Charlie for all his past articles! It is being enjoyed by readers across the world.

Old Business

No old business.

New Business

We are missing our membership blank badge master 3/16th inch thick, 5" diameter brass template for making our badges. If anyone has seen it, or knows where it might have gotten to, please let us know. We are out of badge blanks!

Jon adjourned the meeting at 1057 hours Pacific time, and we moved right into Bits and Pieces.

Minutes of the Board Meeting

Officers present: Jon Sargent, Matt Petach, Jerry Kimberlin, John Lisherness, Rick Reaves, Sammy Tamez. Lisa Kimberlin was present as Ombudsperson and Rich Croll was excused today.

President Jon Sargent called the meeting to order at 1121 hours Pacific time.

Old Business:

Jon Sargent presented the minutes from the March 10, 2024 Board meeting for approval. Matt Petach made a motion that the Board accept them as presented and Rick Reaves seconded the motion. There were no additional discussion, no abstentions & no objections, so the motion passed unanimously.

New Business:

Work Day: There will be a work day on Saturday, April 27, 2024 to excavate and begin work on the retaining wall behind the shop building. Matt will send out an email blast to the members asking for people to volunteer to help on that day.

Delinquent Membership Renewal: Delinquent membership renewal deadline has arrived and it is time to cut off people who haven't paid their dues yet. We may try to contact a few known delinquent members by hand.

Clover Bank Account: Due to a minor miscommunication, we incurred a $217 charge on the Clover bank account. There was a $200 initial setup charge the Board had voted on & approved last month but unfortunately the account was funded with $100 which lead to the overdraft charge.

Club Insurance: Jon is still working with Vivian on the club insurance update.

Club Janitorial Service: Dave Bradas stepped up to take care of club house cleanup twice a month. The Board will approve reimbursement for his supplies and we already have a Rubbermaid storage shed behind the kitchen to store the supplies in.

Club Wood Pile: Paul Hirsh & Jon Sargent picked up a load of wood from Amy Herman's house which brought up some question of whether to get more logs from the East Bay Regional Park District (EBRPD). Matt volunteers to bring a bunch of dried logs from his property to fill the wood shed.

Spring Meet: June 15 & 16 is our Spring Meet. We will have the same arrangement with the EBRPD police to allow overnight parking with night runs on Friday & Saturday nights only.

Endowment Fund: Daren Blonski sent an updated financial report on the club's endowment fund. We pulled $28,000 out of it last year but the fund is still holding its value well.

Handrail Addition: Michael & Chris Smith asked for approval to build a handrail along the red cement wall next to the tracks leading into the turntable area. The Board approve them researching the project and requests they come back with a cost estimate.

Kitchen Oven: There is further discussion of getting an oven for the kitchen. We need to measure the space for it, but it looks like good convection ovens can be bought for about $700.

Club Financial Bank Accounts: John Lisherness went over the account balances including the reserve account. New money will go into the Mechanics bank account and we will draw down the Wells Fargo account & then close it out when empty.

Membership Badges: We have lost track of the big brass pattern for making the GGLS name badges. We need to either find where it went and get it back, or have a new one made.

Pat has an image of the badge that can be exported in autocad or dxf format for Jerry to try out on his CNC router. He will contact Jerry on what application he uses and how he does the badge creation on his CNC router.

Club Clothing Inventory: Matt will check with Bob & Sandy Morris on the value of their remaining club clothing inventory.

Jon adjourned the meeting at 1206 hours Pacific time.

Bits and Pieces

By Jeremy Coombes

Thank you to Pat Young and Bruce Anderson for the additional photographs.

Bruce Anderson went to use the club hydrostatic boiler tester and found it was not working very well. Not one to decline a challenge, Bruce decided to investigate and found a couple of problems.

After seeking approval, Bruce disassembled the unit and methodically worked through the system, replacing and fixing items each time he found them. His efforts were rewarded as the unit now works very well and does not leak back.

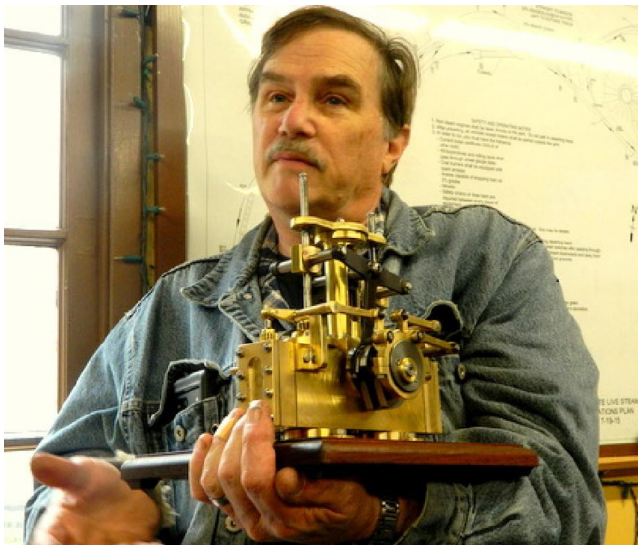
Thanks Bruce! We all appreciate your work on this tester.

Pat Young has been playing with his 3D printer again, and his project this month has an interesting back story.

For those who are new to the club long time member Sue Debeling has done some interesting things for the facility. She was involved with the little buildings you see around the club track, and the most memorable was the life-sized mannequin she created. She planned to put the mannequin in various locations & poses so that the Public Train riders could enjoy it during their journey, and it was a great idea for the returning riders to be on the lookout for it holding signs to advertise club activities. To make a long story short, some unknown person stole Sue's mannequin.

Fast forward 5 years.

So, while Pat was doing his occasional surfing of the Printables.com website, where millions of 3D printable projects are available for downloading, he came across a model that reminded him of Sue's mannequin.
An idea quickly formed, and Pat decided he would print one that she could have. It was first attempted in PLA filament in two colors and produced a 7-inch model, but that type of filament proved to be too weak. He then scaled up the parts to 1/8" scale and printed in PETG for strength and it worked out very nicely. Bruce Anderson was gracious enough to volunteer to take it to her, and it is Pat's hope she will enjoy it & make friends with it. Make sure to give it a name, Sue!



Charlie Reiter brought in his finished Bernay stationary steam engine, made substantially from brass. This model is of a twin cylinder compound engine designed by Joseph Bernay, although Charlie built it as a "simple," and was constructed using some dodgy drawings that Charlie said were more of a suggestion rather than a detailed set of prints. The story, as told to Charlie, was that the plans were drawn by the son of the original builder after-the-fact and lacked a great deal of information that would have been helpful to the builder.
Charlie responded to questions regarding the difference between "simple" and "compound" cylinders, and explained that it is to take advantage of high pressure/high temperature steam, and in the small scales in which we build there is no appreciable advantage to be had as you can't scale physics.

The engine is beautiful, runs well, and the motion is memorizing. I could watch it for hours!

Compounding, the Problem

By Charlie Reiter

At a recent club meeting's Bits and Pieces segment I mentioned compound steam engines and was asked just what "compounding" means. I felt I sort of stumbled through an explanation so I thought I would take this opportunity to explain more on the concept of compounding and why at the hobby level it is not used. For this explanation we will forgo the normal demonstrative math since I'm not good at it anyway.
Compounding refers to the practice of more fully using the energy stored in steam. When steam is passed into a drive cylinder it pushes the piston. Initially the piston is pushed with the full force of the steam but as the piston travels along the cylinder the steam source is cut off and the steam that is now contained expands. Expansion is the most important feature of steam power.
So as the steam expands the pressure is dropping and more importantly, the temperature is dropping. If the expansion of steam is great then the temperature drops greatly and by comparison the exhausting steam is "cold". Hence the cylinder gets "cold" as well. The next charge of steam will be somewhat condensed by the cool cylinder and a loss of energy occurs as entering steam reheats the cylinder walls and loses pressure.
If we limit the amount of expansion in the cylinder, not allowing the pressure to drop so far, then the thermal losses can be somewhat minimized, but what do we do with still potent steam that we exhaust? We put it into another cylinder that is physically larger since the steam has expanded & requires more room, and use the remaining energy to expand it again. So the two cylinders are specialized to their tasks and each has a temperature & pressure range. The idea of compounding is to make the system more thermally efficient.

Our little steam engines suffer from a lot of deficiencies and thermal efficiency is an afterthought for most of our efforts. Some attempts are made by insulating and copying good designs that have inherent efficiencies but really all of our toys are just that, toys that we run for our pleasure. The amount of heat wasted in our little boilers & miniature piping would be astounding in a revenue system.

The most successful compound systems were in ships & stationary power plants. These are both areas where great weight & complicated systems can be implemented. Especially in ships, being at sea the

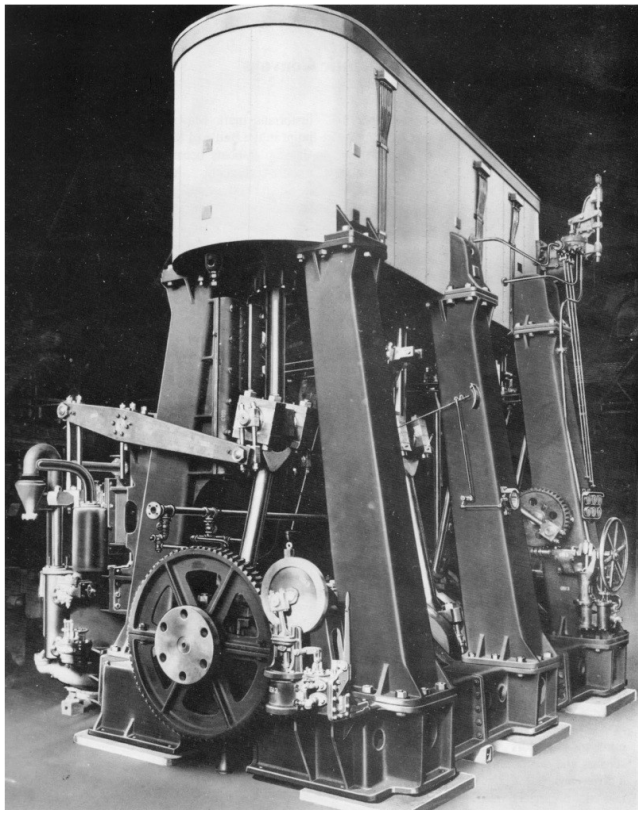
exhaust can be condensed and an even greater efficiency affected. Of course this is also done in power plants with cooling towers or pond heat exchangers.

So although there were many successful attempts made to bring compounding into locomotives, tractors and stationary engines all these systems were complicated for the operators. A lot of the systems were truly successful but complications often outweighed the long term use. And of course the use of steam on railroads or in farm machinery was surpassed by internal combustion.

So can you model compounding? Of course, it will work enough to give the sense of the prototype and it's cool to make a system of compounding. Here are a few considerations. In order to make a system begin to work you need to extend the initial temperature & pressure. The starting pressure should be more like 125-150 psi, so this means a stronger boiler and as you upgrade the boiler, everything about it needs to be upgraded. Your system needs to have every part of it thought out to minimize thermal loss.
Now that you have gone to that effort, what are you going to do with it? A compound engine only attains efficiency while running in a steady state. Starting & stopping keeps the system in a state of flux where real compound action is never achieved. To run in a steady state requires running against a constant load. Generating power is good but the load should not vary much. A ship has a constant load and this is a common use of compounding in the full size steam boat hobby.
There are other advantages to compounding such as lowering the stresses on individual parts by distributing the power across multiple cylinders. And the multiple cylinders can allow an increase in reliability.

It is difficult to demonstrate a model compound engine because without load a multi-cylinder engine will just run on the first cylinder, especially on air, which lacks the same expansion property of steam. Think about all the model engines that get demonstrated on low pressure air. When it runs slow on 5 pounds of air there is nothing left at the exhaust. Models of large compound locomotives have been built and operated but not with efficient compounding. Compound model tractors were routinely built but many more have been built using 2 simple cylinders disguised as compounds, because the compounds spend all their time running on cylinder one.

I still think it's all really cool though. I have compound engines and would build another.



This is the type of triple expansion engine that was fitted to liberty ships. It weighs 270,000 pounds, and at full power can develop 2,500 ihp (indicated horse power) at 76 rpm. The balance between the cylinders is excellent at steady state with the high pressure cylinder contributing 834 and the mid & low pressure cylinders both at 833 horsepower. This is on a supply pressure of 220 pounds. The three cylinder diameters are 24.5, 37, and 70 inches in diameter and the stroke is 48". The pressure drops across the cylinders are 220-75, 75-14, 14-26. The low pressure cylinder negative value is due to the vacuum of the condensing system.
At the time these engines were built they were already obsolete but as the art of their creation was so well understood there were many firms that could supply them.

One of these engines can be seen by visiting the SS Jeremiah O'Brien liberty ship in San Francisco
https://www.ssjeremiahobrien.org/pages/history-of-the-obrien
The ship used to steam up once a month so check their schedule and see the big engine run.

RG22 Boiler Tube Rolling Adventure

By John Davis

Photos by author unless noted.

Last summer while engineering on the Public Train, Paul Hirsh noticed water leaking out of the firebox on the RG20 engine. On further inspection, 14 of the 23 tubes were leaking around the firebox tube sheet so the engine was taken out of service. On this engine, the tube sheet on the fire box side is 0.375" steel plate. The tubes are 3/4" type K copper pipe, Outside Diameter (OD) is 0.875" and Inside Diameter (ID) is 0.750" (nominal). We don't know why the tubes started leaking (or for how long) but possibly overheating of the tube sheet has occurred during its lifetime. Most of the leaky tubes were towards the center or the tube array. None of the tubes were leaking on the smoke box end.

Neither Paul nor I had any experience repairing or rolling leaky tubes so we checked with other members to learn as much a we could, but there were still many unanswered questions. This article will outline what we tried, what worked & what didn't, and hopefully give you a place to start if you need to roll boiler tubes.

Before we started the rolling process, we tested for leaks by putting 50 psi air in the boiler and checked with soapy water leak checker. This allowed us to identify exactly which tubes were leaking. If there was a question on which tube was leaking, blowing off the foam with an air gun and testing again was simple. Using pressurized water would have made it more difficult to identify leaky tubes with water everywhere. More on using water to detect leaks later.

Checking for leaks through the firebox door using liquid leak checker and a headlamp.

Firebox view of boiler tube sheet showing leaks.

GGLS owns a set of tube rollers and there was an Elliott Tool Technologies roller for 0.75" ID copper tubes like the ones in the RG22. We started by cleaning the tubes with a 12 gauge shotgun bore brush and cleaning rod, and it seemed like we blew lots of soot out of the tubes. For our first attempt to roll, we used a light weight oil and found that the roller would get clogged up with soot and flakes of copper with each use. It required taking the roller apart and thoroughly cleaning with each use, and even then the roller would slip in the tube. Subsequent test showed little or no improvement in the leaks. We decided to try rolling without lube thinking that we would pick up less debris. Still lots of debris, especially copper flakes, and no leak improvement.

We needed more advice. Richard Croll suggested I contact Bill Boller, PV&A. I also contacted Marty Knox, the maker of the original boiler we were repairing, and Elliott Technologies who manufacturers the tube roller we were using (I never did get to talk to anyone at Elliott, they never returned my calls). Both Bill & Marty were very helpful. Among their suggestions, Bill suggested cleaning the tubes more thoroughly. Marty suggested using Crisco shortening for the lube. We bought a set of stainless steel tube cleaning brushes which had hex shanks and scrubbed the tubes using a drill motor. During this process, we discovered the tubes were only rolled to just beyond the tube sheet thickness, yet our roller with the existing sleeve went well beyond that point. (Seems obvious now that you wouldn't roll any deeper than necessary). We also discovered that the stock sleeve and thrust bearing on the roller interfered with the crown sheet on the top tubes. So I machined a sleeve and bearing suitable for our job.

Elliott tube roller. Custom sleeve and thrust bearing to the right of the locknuts. Stock sleeve and thrust bearing to the left of the nuts for comparison.

Jim McKibben had a Mitutoyo ID micrometer which was very useful for measuring what we actually had in our tubes.

Jim's internal micrometer

Bill had also suggested that perhaps we weren't aggressive enough with the roller. So now with shiny tubes, lots of Crisco for lube, a proper sleeve to limit the rolling depth, and a 1/2" DeWalt drill motor, we went at it again. The point at which we stopped rolling was empirical and we tried to be consistent, stopping the drill motor when the same load was felt. We were also using a flexible 3/8" flex socket extension which would limit torque by twisting. With the cleaner tubes, the roller would be good for two or three tubes before it needed cleaning but the amount of cleaning was much less.

All the tubes tested good once we got all the problems fixed. This test should be with water in the boiler and compressed air on top. While using compressed air and no water made it easier to identify leaking tubes, it may also find tubes that wouldn't leak with water. And, of course, the final test is a fired boiler at pressure.

One more point; at the beginning of the project we were studying the tube crush specifications on the charts provided by tube roller manufacturers. We found the RG22 tubes were crushed beyond the limits of the charts before we even started.

Marty commented that this is not an exact science and perhaps we were over-thinking the problem. In the end, we rolled the tubes until they sealed.

So here's a checklist for tube rolling:

1) Paul & I worked on this project together and in many cases two people were required to get tools in and out of the fire box from below & through the firebox door. So a helper may be required. We removed the burner for easier access to the firebox from below.
2) Block or chain the engine so it's stationary for safety reasons. Place throttle in off position and the Johnson bar in neutral.
3) Test the tubes with compressed air in the boiler and soapy water leak checker. Make a drawing of the boiler tube sheet and mark the tubes that leaked & need rolling.
4) Thoroughly dry & clean the tubes to be rolled. The original shotgun bore cleaner we tried wasn't aggressive enough and stainless steel tube brushes under power worked well (Amazon - Vouyar 6pcs Copper Tube Pipe Cleaner, 1/2" 3/4" 1" Pipe Cleaning Brush Set). If necessary, clean the inside of the tubes with emery cloth or a file for hard deposits. You want the interior surface of the tubes to be clean but don't remove copper. Blow debris out of the tubes with compressed air. We also flushed out the tubes with water & blew them dry. ***Clean tubes are probably the most important part of successful rolling.***
5) Measure or calculate the depth you need to roll and machine a sleeve & thrust bearing for the roller to suit the job. There are threads & locknuts on the tool for fine adjustments on the sleeve depth.
6) Take apart & clean the tube roller thoroughly. Make sure you reassemble the roller correctly and tighten the nut on the end of the tapered shaft. The tapered ends of the three rollers are assembled toward the tip of the tool.
7) Squeeze Crisco shortening in between the rollers on the cleaned tool. You want all the space between the rollers & the tool to be filled with lube.
8) The roller tool has a square drive and can be driven by a 8 or 12 point socket. We used a 3/8" flexible socket extension but I think it would be better to use rigid socket extensions and a universal joint (or two). With the right setup you may be able to reach all the tubes through the firebox door. Turn the roller shaft clockwise to tighten the tubes and counter-clockwise to remove the roller tool.

9) Roll the tubes until you feel resistance. In our case this was the ½" DeWalt drill motor loading up. I would go slow, test for leaks and then go further if necessary until you get the proper feel.
10) Re-test for leaks using compressed air on top of water in the boiler. If all looks good, do a final test with water in the boiler fired up and at operating pressure. If water leaks are found, go to step 2).

One final thought: If you have first-hand information about rolling tubes that wasn't included in this article, please contact me at 510-915-1696, text or voice, and let me know your experiences.

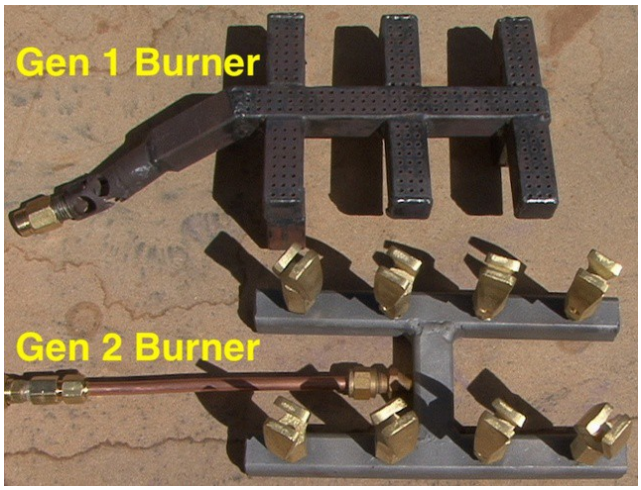
A Railroad Mothers Day Event

For those who are strapped for ideas on what to do for Mother's Day, consider this offer from the River Fox Train.
More information can be found at:
www.info@sierrarailroad.com

Propane System & Flame Arch

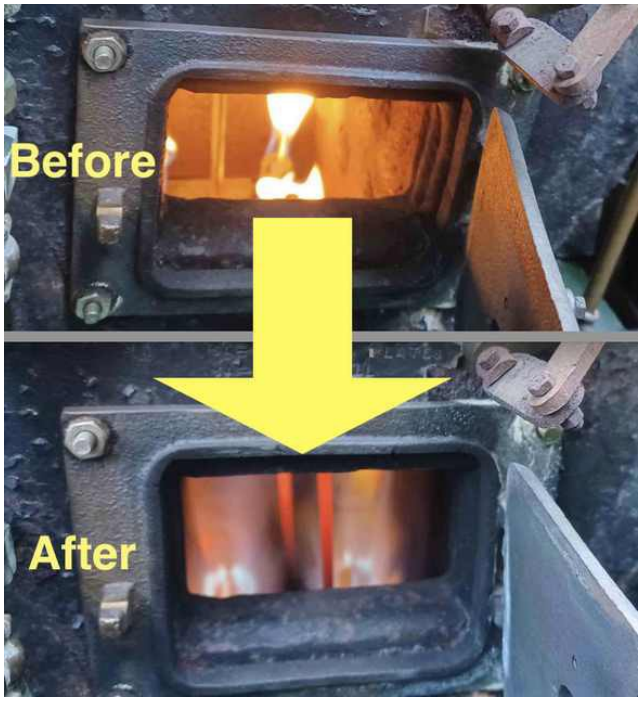
The Second Of Three "Harley" Projects
by Bruce Anderson

Recently I wrote a story about performing a timing on the 0-4-0T Harley to improve his performance. This month the story will be on the propane fuel system for generating steam. Harley has had three states of steam: usually adequate, occasionally marginal, and rarely flat-out lacking. Harley is currently on his fourth generation of propane firing and I think this one's a winner!



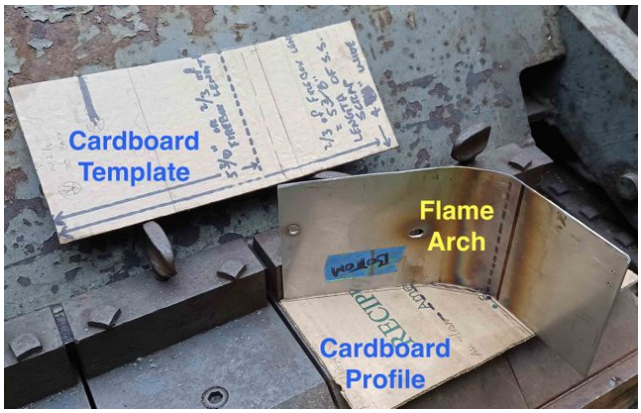
Harley has evolved through three types of propane burners: the original custom-made burner ($$$), an Amazon wok style burner set ($20), and a LocoParts "Standard Burner" set ($144).

The first generation custom-made burner failed after its third use. Jerry Kimberlin was kind enough to fabricate a new propane manifold for Harley that I populated with eight wok style burners. This system had two problems: flame control and an overall lack of heat. After months of mixture (fuel-to-air ratio) tweaks, I contacted LocoParts and ordered eight of their "Standard Burners."

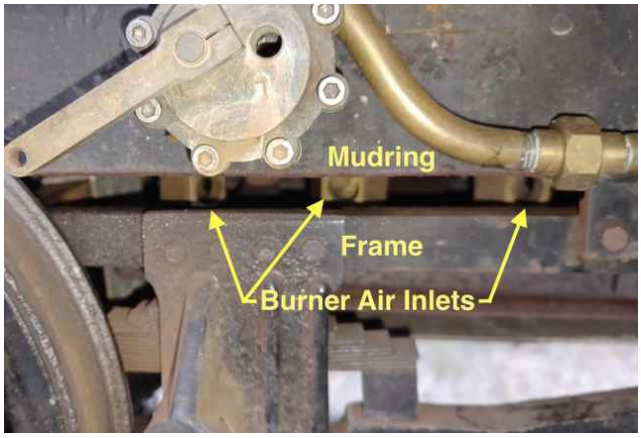


This third generation system usually gave Harley between adequate and occasionally marginal steam pressure.

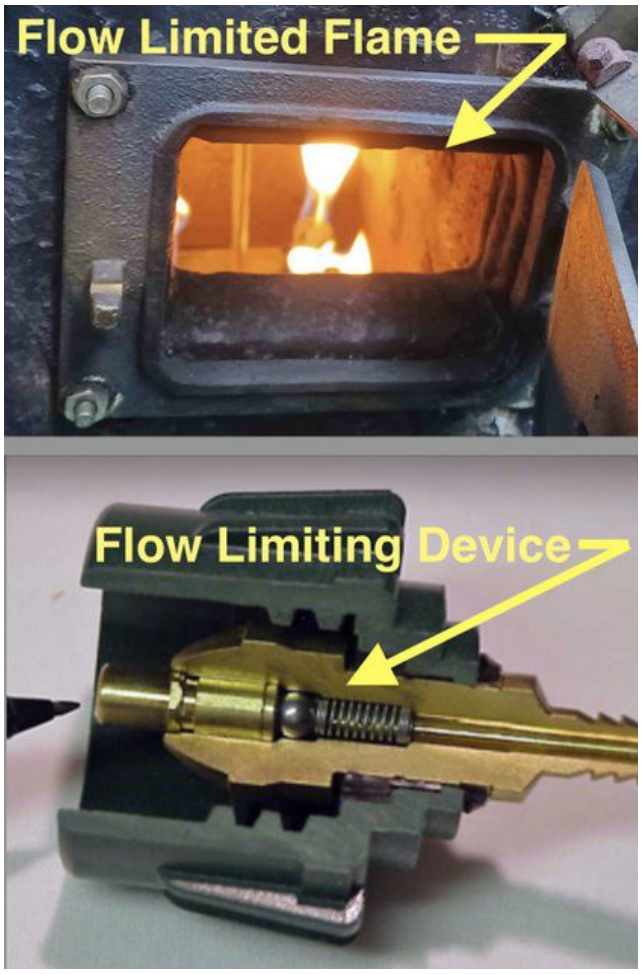
While reading The Steam Locomotive In America (Alfred W. Bruce, 1952), I learned that the primary reason for flues within a boiler was to exhaust combustion gasses from the firebox, not heat transfer as I had thought. The book said that 65% to 75% of heat transfer was done in the firebox, not the flues. Adding a flame arch inside the firebox increased the surface area for heat transfer to take place. I had already been thinking of installing a flame arch when I read Bill Boller's article "Taking the 'Pain' Out of Propane" (Live Steam & Outdoor Railroading, Sept/Oct 2021).



Using a scrap piece of stainless steel from Harley's saddle tank, I went to work. When I added the flame arch, Harley appeared to be generating more steam with less propane.

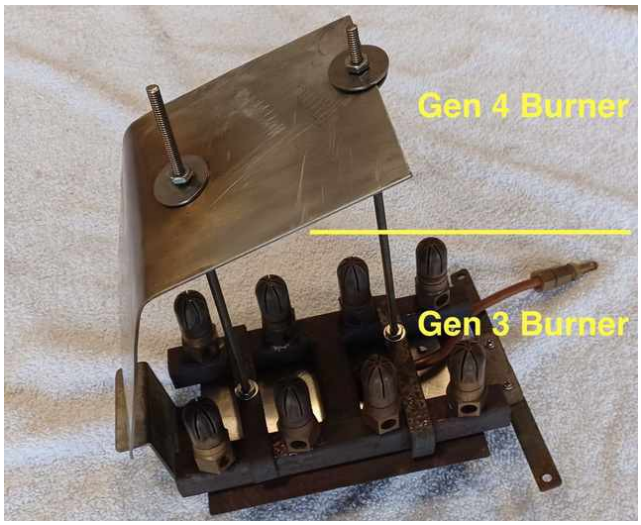


Adding a plate underneath the manifold restricted cool air from entering the firebox from below. One issue down.



The flat-out lack of steam turned out to be a totally different issue. Rarely Harley would have this little yellow flame that just would not generate steam. I thought it was propane use causing a temperature drop causing a pressure drop. Having talked with friends and doing more research, this issue turned out to be a "flow limiting device" built into the hose connection.

Designers of the system figured a rapid flow change indicated a damaged line triggering the flow limiting device (see photo). I finally found the answer to this on a recreational vehicle website — just loosen, listen for the gas to escape, and re-tighten the propane hose from the tank. This releases the pressure between the hose and the tank resetting the flow limiting device. I've tested it, I've used it, and it works like a charm!



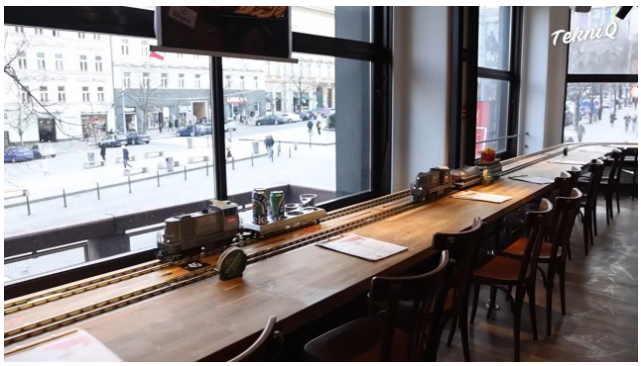
The final solution

Voila, another issue down.

There's one more project to share in this series. Harley has a new manually operated set of cylinder drain cocks. This added so much to Harley's look and sound! The learning experience was really cool too. Possibly another story for an upcoming CallBoy.

Video Recommendation

From Loren Byron



An unique 11:00 minute YouTube video by author TEKNIQ titles "Inside Strange Restaurant Delivering Burgers by Trains"
located in Prague, Austria.

He describes that "in this episode on Tekniq, we will observe the unique way a restaurant in Prague delivers its food and drinks to customers using model trains".

The trains seem to be G-scale or larger and his video can be found at:
https://www.youtube.com/watch?v=FmvZpHVWkKg

From the Membership

While cleaning up some items for the upcoming GGLS Swap Meet, Bruce Anderson pulsed Pierre Maurer if he might be interested in a six-inch Craftsman lathe.

Pierre said, "Oh yeah."

Pierre is looking forward to completing a partially built 1½" bore by 2" stroke Shay locomotive engine.

April 2024 Swap Meet Photos

The April 2024 General meeting also included a Swap Meet. Those attending with items that took up space brought many bargains for those early bird buyers.

Jo Ann Miller showed up with model train items and tools.

A trailer with electrical & electronic apparatus at bargain prices showed up too.

And Bruce Anderson had much action at his truck including some possible offers for Harley, his 0-4-0T steam engine. It was not determined if Harley has a new home or not.

Killamarsh Humor