



Maricopa Live Steamers

STACK TALK

JUNE, 2020

The official newsletter of the Adobe Mountain Railroad in Phoenix, Arizona.
Operated by the Maricopa Live Steamers Railroad Heritage Preservation Society.



President's Page

It is really hot, so if you come out to the park, remember to bring WATER, WATER and then some WATER.

It would be in the best interest of the park that you do not drive your vehicle or park in the tall weeds, because in many locations they are tall enough to reach the catalytic converter on the exhaust system. All autos today have guards under the converter as a shield, but somehow the tall weeds seem to get close enough to start a fire, and that is something to see when a car burns to the ground. The converter at operating temperature reaches from 1200 to 1380 degrees Fahrenheit.

According to BLM statistics, 95% of brush fires are accidentally caused with only 5% percent attributed to arson. Vehicles with dragging chains is the number one cause, with someone pulling off the road into tall grass where the converter starts the fire is the number two reason. Number three is hot brakes on tractor

Vice President's Page



trailer trucks, with number four being careless disposal of burning material like cigarettes and camp fires.

The State Route 52 fire in Julian, California was started by a vehicle pulling off the road to change a tire, and set the weeds on fire, burning over 200 homes in the Julian area in 2018. The freeway fire of 2019 did 3 million dollars damage and was started by a pickup truck parked in the weeds. It was still there when the fire department arrived, but was a total loss. If we have a big fire, the fire dept. will come in and put it out, just like they did last year, and they do not know how much damage they can do to the track and our property. Their job is to stop the spread of fire so that it does not reach homes or structures. Please be aware of where you are driving or parking in the park. – Joe

Here is one of the nice residents of the park. Some people call it a king snake, some call it a gopher snake, some call it a bull snake, but none the less, **Please, do not hurt this one.** They eat the ground rodents that dig under the track and cause us problems. This does not have a viper shaped head and has black rings at the pointed tail. They eat the scorpions and will even take on a small rattler and eat it. This one stretched across the road and, since the track width of the cart is 4 feet, this one is about 5 feet long, so he has been around for a while and it looks like he is well fed. This picture was taken at about 9 am and about 85° that day. **THANK YOU.** – Joe

FRIEND of the PARK



COVID-19 RESTRICTIONS are still in place.
For members' health and safety, until further notice, all social activities at the Park have been cancelled.

State mandates are still in place prohibiting gatherings of more than 10 people, and everyone must stay at least 6 feet apart. ONLY members / immediate family can be at the Park. NO parties or gatherings of any type can take place at the Park.

If anyone has information that could be used to answer this email, PLEASE contact Hank Gallo.

From: Brian Hillsdon <brian-hillsdon@outlook.com>

To: "info@maricopalivesteamers.com"

Sent: Saturday, May 16, 2020, 3:51:53 AM PDT

Subject: Miniature gauge steam locos. 8 inch to 19 inch. (NOT 7-1/2)



hanksgt@yahoo.com

Dear Live Steamers. A group of us here in GB are trying to compile a worldwide survey of miniature gauge steam locomotives 8 to 19 inch gauges, something that no one else has ever done. A friend of mine visited your clubhouse back in May 2012 and saw a nice little 0-6-0 under construction by John Bohan, 15 inch gauge. Could you please, please help us with any up-to-date historical details that you may have on this loco? For instance, year completed? Is it still with you? If not, do you know where it is now? We were wondering if you now have a 15" gauge running line, and perhaps any other 15 inch steam locomotives? If you could help this would be very much appreciated.

From one steam loco fan to another, Good Steaming --- Brian Hillsdon. Brian-hillsdon@outlook.com

Railroad Name

Gauge

Location

Arizona Grand Scales Railroads:

Arizona and Pacific Railroad	16"	Peoria, Arizona
Daisy Mountain Railroad	24"	Anthem, Arizona
Desert Breeze Park Railroad	16"	Chandler, Arizona
Enchanted Island Express	24"	Phoenix, Arizona
Freestone Park Railroad	16"	Gilbert, Arizona
Marana Pumpkin Patch and Farm Railroad	16"	Marana, Arizona
Old Tucson Studios Railroad	24"	Tucson, Arizona
Paradise and Pacific Railroad	15"	Scottsdale, Arizona
Schnepf Farms Railroad	16"	Queen Creek, Arizona
Trail Dust Town Railroad	24"	Tucson, Arizona
Wildlife World Zoo Railroad	16"	Litchfield Park, Arizona

Arizona Smaller Scale Railroads:

Adobe Mountain Desert Railroad Park	7-1/2"	Phoenix, Arizona
Scottsdale Live Steamers	7-1/2"	Scottsdale, Arizona

Arizona Narrow Gauge Railroads:

Superstition Scenic Narrow Gauge Railroad	36"	Goldfield, Arizona (Goldfield Ghost Town)
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NEWS RELEASE

Date:
May 28, 2020

Website:
<http://www.maricopacountyarks.net/>

Contact:
Dawna Taylor
Public Information Officer
Office: (602) 506-9504
Cell: (480) 694-0394



Fire restrictions increased in Maricopa County's regional parks

The Maricopa County Parks and Recreation Department initiated its annual fire ban on May 11. Now, the department is taking additional steps to protect park visitors and resources due to the extremely dry conditions. **Effective Monday, June 1, smoking in Maricopa County's regional parks will be prohibited, except within an enclosed vehicle or at developed recreation sites such as parking lots and campsites.** The restriction comes on the heels of increased wildfire activity throughout Maricopa County.

"Last week, we had wildfires in two of our regional parks and along the Maricopa Trail, which resulted in park visitor evacuations and damage to the parks. To better protect park visitors and lessen the chance of human-caused wildfires, we are adding smoking restrictions in our annual fire ban. Individuals who smoke in the designated areas are also being asked to please make sure all materials are fully extinguished before leaving the area," stated R.J. Cardin Maricopa County Parks and Recreation Department Director.

The usual restrictions, which include banning the use of all campfires, fire pits, and the use of charcoal in grills or any other manner, are still in effect; however, it is acceptable to use gas/propane grills in designated areas. Violation of Park Rule R-113 may result in a citation. A date to lift the fire ban has not been established.

Eleven Maricopa County regional parks have been affected by the fire ban: Lake Pleasant Regional Park, White Tank Mountain Regional Park, Adobe Dam Regional Park, Buckeye Hills Regional Park, Estrella Mountain Regional Park, Hassayampa River Preserve, San Tan Mountain Regional Park, Utery Mountain Regional Park, McDowell Mountain Regional Park, Cave Creek Regional Park, and Spur Cross Ranch Conservation Area.

If you have any questions regarding the fire ban, call the Maricopa County Parks and Recreation Department at (602) 506-2930, or visit <http://www.maricopacountyarks.net/>.

##30##



Maricopa County
Parks & Recreation Dept.
41835 N. Castle Hot Springs Rd.
Morristown, AZ 85342
Phone: (602) 506-2930

From the Desk of: Dakota Clemens
Tower Signal Superintendent

Subject: Current Status

I had surgery on the 15th and am currently in Seattle until I heal.

All is going well and everything has been healing fine.

From the Desk of: John Draftz – Past President

Subject: Degree – Railway Management Certificate Program



Center for Railway Research and Education – MSU Broad College of Business

<https://broad.msu.edu/railway-center/>

[CLICK FOR PDF BROCHURE](#)

We aim to provide expertise in strategic business leadership, supply chain integration, technology decisions and the interface between different stakeholders. Our multi-disciplinary approach involves:

- Management functions within the supply chain (operations, marketing, asset management and interaction)
- Engineering disciplines (civil, mechanical, electrical and communication engineering)
- Intersections between supply chain management and engineering that constitute complex railway systems.

Additionally, our research and education covers all types of railways, including:

- Freight railroads of any size
- Long-distance passenger
- Urban railways (metros and light rail)

From the Desk of: Dick Wieboldt – Engineer

Subject: For Sale: Winton Consolidation

Superscale fittings and injectors.

Running gear professionally rebuilt recently.

Current Maricopa Live Steamers boiler certificate.

Extras including 500 pounds of coal.

Asking **\$14,000** Email: dgwrailroad@earthlink.net

Cell: 614-361-1235



HELP NEEDED!

MAKING CONCRETE TIES

Story and photos by Perry McCully

The first thing you have to do is come up with a hair-brain idea. Then you come up with a plan to make ties that look like ties. You go to Home Depot and go *"aha!!!!"* and purchase mud pans that dry wall board people use to tape joints, 90 pans to be exact.

Now how to screw the rail to the tie? You can't drill holes in the tie after it's dry. That's too much work and it weakens the tie. Another hair-brain idea is needed. Then someone remembers a plastic anchor. OK, so you have plastic anchors. How do you set them in wet cement and make them stay in the right place? *"Oh, oh."* Another idea comes to mind. Drill four holes in the pan, with two holes per end, staggered of course, and weld nails onto the pan so that the anchors can be slipped onto the nails.

Then another problem arises, cement was getting into the anchors, and so the screws wouldn't go into the anchors, making the tie layer have to stop and drill out the anchors with a small masonry drill. There are 360 plastic anchors in 90 pans. So, "how do you keep cement out of the anchor?" you might ask. You see another idea coming, don't you?

You give a man a hot glue gun and a bag of 10,000 anchors and plug one end of the 10,000 anchors. Problem solved? Wrong!! If the mixer got the cement too wet, the anchor would float off the nail because air is trapped in the anchor. The only way to fix that problem is dump the pan of cement over the head of the mixer and start over again. Maybe the mixer won't make that mistake again.



(continued next page)

MAKING CONCRETE TIES (cont'd)

Then you add a piece of rebar to strengthen the tie, after someone spent hours cutting up 20 ft. lengths into about 12 inch lengths. Who knows how many 14 inch metal cut-off blades were ground up cutting rebar. Now you can start pouring cement into the pans.

After three or four batches of ties, the ties won't fall out of the pans anymore because of cement residue on the pans. To fix this problem, you paint the pans with vegetable oil, but after awhile, you have to stop and clean the pans. We have now solved all the problems and are making at least 90 ties per week and sometimes 180 ties.

It takes eighteen 60 lb bags of cement to make 90 ties. "Who handles 1/2 ton cement?" you may ask. Someone has to get a trailer hooked up to a truck and go get a pallet of cement. Then someone gets the fork lift and takes the pallet off the trailer. One person mixes the cement, one scoops the cement from a wheelbarrow by way of a number ten can into the pans, and one person levels and tamps the mud to get the air out of the cement, then puts in the rebar and smoothes out the cement before it sets up. It takes about three man hours to make 90 ties. Then you come back the next day, dump out the pans and finish by putting those 90 ties into a gondola car. And now you know the rest of the story.

Anyone want to come out Sat. at 6 AM and help? It would be greatly appreciated.

Look like a lot of fun? Please join us. We elders are pooping out.


— Perry
pmccully3@cox.net

Thanks everyone for a job well done.



MEMBER CONTRIBUTIONS!

Maybe some of these aren't railroad related, but during these trying times, a little fun is healthy.

Please click the link to bring up the internet window. If your browser is too old to play .mp4 videos, then you will have to click the download icon . When the download is finished, you can open it in Windows Media Player. The MOTORS get a little loud.

CLICK LINK to DOWNLOAD from GOOGLE DRIVE:

[MINIATURE MOTORS](#)

This looks like something some of our members and others in model-related hobbies would enjoy.

from John Draftz

CLICK LINK to DOWNLOAD from GOOGLE DRIVE:

[MILK MAGIC](#)

Amazing.

from John Draftz and Bill Myers

CLICK LINK to DOWNLOAD from GOOGLE DRIVE:

[WHEN GERMAN ENGINEERS GET BORED](#)

Another innovation from Volkswagen that our members might find interesting.

from Bill Myers

CLICK LINK to DOWNLOAD from GOOGLE DRIVE:

[WHY MEN NEED TOOLBOXES](#)

This fantastic group of guys show off their incredible skills using tools and toolboxes.

from Bill Myers

Here are 9 great mechanical principles and inventions which show the greatness of the human mind.

1. [Aircraft Radial Engine](#)
2. [Oval Regulation](#)
3. [Sewing Machines](#)
4. [Malta Cross Movement](#) – clock's second hand movement
5. [Automation File Mechanism](#)
6. [Automation Constant Velocity Universal Joint](#)
7. [Gun Ammunition Loading System](#)
8. [Rotary Engine](#) – an internal combustion engine, the heat rather than the piston movement is converted into rotary motion
9. [Boxter Engine](#) – it's cylinders line up side by side

from John Draftz

A Most Revealing History

from Bill Myers

This is easily the most meaningful piece I've read yet during this pandemic . . .

Maybe we don't have it that bad?

It's a mess out there now. Hard to discern between what's a real threat and what is just simple panic and hysteria. For a small amount of perspective at this moment, **imagine you were born in 1900.**

On your 14th birthday, **World War I** starts, and ends on your 18th birthday. **22 million people perish in that war.** Later in the year, a **Spanish Flu epidemic** hits the planet and runs until your 20th birthday. **50 million people die from it** in those two years. Yes, 50 million.

On your 29th birthday, the **Great Depression** begins. **Unemployment hits 25%**, the **World GDP drops 27%**. That runs until you are 33. The country nearly collapses along with the world economy.

When you turn 39, **World War II** starts. You aren't even over the hill yet. And don't try to catch your breath. On your 41st birthday, the United States is fully pulled into WWII. Between your 39th and 45th birthday, **75 million people perish in the war.**

Smallpox was epidemic since before you were born until you were in your 40's, and it **killed 300 million people** during your lifetime.

At 50, the **Korean War** starts. **5 million perish.**

From your birth until you were 55, you dealt with the **fear of polio epidemics** every summer. You experience friends and family contracting polio and being paralyzed and/or dying.

At 55, the **Vietnam War begins** and doesn't end for 20 years. **4 million people perish** in that conflict.

During the Cold War, you lived each day with the **fear of nuclear annihilation.** On your 62nd birthday, you have the **Cuban Missile Crisis**, a tipping point in the Cold War. Life on our planet, as we know it, almost ended. When you turn 75, the **Vietnam War finally ends.**

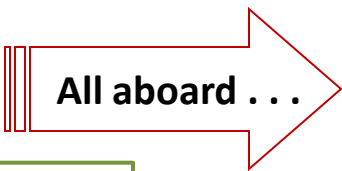
Think of everyone on the planet born in 1900. How did they endure all of that? As a kid in 1985, you didn't think your 85 year old grandparent understood how hard school was? . . . how mean that kid in your class was? Yet they survived everything listed above. Perspective is an amazing thing . . . refined and enlightening as time goes on. Let's try and keep things in perspective.

Your parents and/or grandparents were called to endure all of the above – we are called to stay home and watch TV for 3 months. Do we really have it that bad?

The Discoverer

The Most Scenic Train Trips in the U.S.

Before the Interstate opened and air travel became more affordable, the most relaxing (and fashionable) way to travel the United States was by train. Some of those epic train trips still exist, and there’s nothing quite like the unhurried pace of riding the rails as you enjoy breathtaking views of the American landscape. Take one of these “most scenic train trips in the U.S.” for a journey unlike any other.



Related Articles:

[5 Train Routes in the U.S. That You Can’t Ignore](#)

[6 Most Jaw-Dropping Train Routes in the World](#)

[5 Most Luxurious Train Rides](#)

8 Highly-Underrated American Treasures

There’s a reason places like Yosemite National Park and the Grand Canyon receive millions of visitors each year. I mean, who wouldn’t want to spend the day chasing waterfalls or standing over an unfathomable copper-colored canyon? But the U.S. is so vast and diverse, and it’s packed full of relatively undiscovered, unique natural treasures that are hidden in plain sight. Let’s face it – you could spend a lifetime trying to track down and visit every breathtaking spot in this country and you’d probably just barely scratch the surface. So, to save you some time, we’ve put together a list of some of our favorite hidden American treasures that are worth adding to your bucket list.



DAILY Discoveries



Click photo

from John Draftz



Click photo

TRACKING TRACKSIDE PROGRESS

2020

FOR THOSE WHO HAVE NEVER SEEN A HEAT KINK,
better to see it here, than under your engine!!!

story and photos by Joe Schnyder

← This spot, on the east side of Martin's Ferry bridge, not only had old ties and small screws from the original installation of Werner back in 2003, but there has been considerable tie damage from termites. The other day, Mike Grant was out with his train taking some visitors for a ride when he hit this spot, and the rails spread under him from weak tie conditions and the 107° heat that afternoon. The integrity of the ties was eaten up inside by the termites, which is where the lateral forces of rail expansion have to go, and you can see it went left about 4 inches. Mike had to rerail his engine and riding car, and then back up all the way to the station and take Bobberg, so that the visitors could see some of the park. This visitor was looking to buy a train and also needed information about joining the club.

When the railroad has a sun kink, it usually comes from disturbed ballast, where something has hit the rails to cause lateral movement, like a vehicle crossing the track (without it being a grade crossing) and spinning its tires in the ballast to get across, or by people walking on the ballast outside the rails. Sometimes it comes from train handling by the engineer, such as heavy braking in a curve or in the approach to a grade crossing. Because of the size of the ties in a switch and all the extra weight and ballast to support a grade crossing, they have a tendency to be very rigid and not give at all, causing the stretched excess rail to bunch up near the grade crossings and switches. This excess rail can lead to a sun kink if not controlled through distressing (cutting out a few inches of rail and welding it back together to eliminate tensions from summer heat). Most all of the sun kinks happen in April and May of each year in the spots where broken rail had been replaced during the winter, but was not heated to the high temperature needed to distress the rail properly

for the summer. Here in Phoenix, the rail laying temperature for the prototype railroads is 135 degrees, and from Gila Bend to Palm Springs California it is 145 degrees. So where I am laying this rail in the summer, it will be about 135 degrees when I ballast and anchor the rails, so we should be good for the summer heat. If the temperature drops below 30° in the winter, it will open up some and might break some of the bolts holding the rails together. If it is all welded together, as in CWR or ribbon rail, the ties and ballast we use would hold the rails from moving too much. The ballast we use has a clay like adobe consistency to it, which acts like the anti-creepers used on the rails of the prototype 56-1/2 inch railroads.

This project should take about 1 week to complete from start to finish, including tamping and water. The joints are bolted together for now, until the fire ban is off, which is when I will weld the rails together. I heard someone say they missed the click-clack of the joints. I am used to ribbon rail, since I like it quiet. Each joint is a potential problem spot, and that is why railroads went to CWR. We are able to do it here at MLS because of the ballast we use and how much we use (minimum 4 inches) to hold the track stable. That adobe is very hard after it has been tamped and watered. Full ballast in the middle and wide shoulders work their magic for us. Well, this spot has seen quite a few trains over the years and, when done, it will be good for many more years.



TRACKING TRACKSIDE PROGRESS

2020

CWR (continuous welded rail), aka RIBBON RAIL

definition from Wikipedia

Most modern railways use **continuous welded rail** (CWR), sometimes referred to as **ribbon rail**. In this form of track, the rails are [welded](#) together by utilizing [flash butt welding](#) to form one continuous rail that may be several kilometers long. Because there are few joints, this form of track is very strong, gives a smooth ride, and needs less maintenance; trains can travel on it at higher speeds and with less friction. Welded rails are more expensive to lay than jointed tracks, but have much lower maintenance costs. The first welded track was used in Germany in 1924,^[25] and has become common on [main lines](#) since the 1950s.

The preferred process of flash butt welding involves an automated track-laying machine running a strong [electric current](#) through the touching ends of two unjoined rails. The ends become white hot due to electrical resistance and are then pressed together forming a strong weld. [Thermite welding](#) is used to repair or splice together existing CWR segments. This is a manual process requiring a reaction crucible and form to contain the molten iron. Thermite-bonded joints are seen as less reliable and more prone to fracture or break.^[26]

North American practice is to weld $\frac{1}{4}$ mile (400 m) long segments of rail at a rail facility and load it on a special train to carry it to the job site. This train is designed to carry many segments of rail which are placed so they can slide off their racks to the rear of the train and be attached to the ties in one continuous operation.^[27]

If not restrained, rails would lengthen in hot weather and shrink in cold weather. To provide this restraint, the rail is prevented from moving in relation to the tie by use of clips or anchors. Attention needs to be paid to compacting the ballast effectively, including under, between, and at the ends of the ties, to prevent the ties from moving. Anchors are more common for wooden ties, whereas most concrete or steel ties are fastened to the rail by special clips that resist longitudinal movement of the rail. There is no theoretical limit to how long a welded rail can be. However, if longitudinal and lateral restraint are insufficient, the track could become distorted in hot weather and cause a

derailment. Distortion due to heat expansion is known in North America as [sun kink](#), and elsewhere as buckling. In extreme hot or cold weather, special inspections are required to monitor sections of track known to be problematic. In North American practice, extreme temperature conditions will trigger slow orders to allow for crews to react to buckling or "sun kinks," if encountered.^[28]

After new segments of rail are laid, or defective rails replaced (welded-in), the rails can be artificially stressed if the temperature of the rail during laying is cooler than what is desired. The [stressing process](#) involves either heating the rails, causing them to expand,^[29] or stretching the rails with [hydraulic](#) equipment. They are then fastened (clipped) to the ties in their expanded form. This process ensures that the rail will not expand much further in subsequent hot weather. In cold weather, the rails try to contract, but because they are firmly fastened, cannot do so. In effect, stressed rails are a bit like a piece of stretched [elastic](#) firmly fastened down. In extremely cold weather, rails are heated to prevent "pull aparts".^[30]

CWR is laid (including fastening) at a temperature roughly midway between the extremes experienced at that location. (This is known as the "rail neutral temperature.") This installation procedure is intended to prevent tracks from buckling in summer heat or pulling apart in the winter cold. In North America, because broken rails (known as a *pull-apart*) are typically detected by interruption of the current in the signaling system, they are seen as less of a potential hazard than undetected heat kinks.

An expansion joint on the [Cornish Main Line](#), England Joints are used in the continuous welded rail when necessary, usually for signal circuit gaps. Instead of a joint that passes straight across the rail, the two rail ends are sometimes cut at an angle to give a smoother transition. In extreme cases, such as at the end of long bridges, a [breather switch](#) (referred to in North America and Britain as an *expansion joint*) gives a smooth path for the wheels while allowing the end of one rail to expand relative to the next rail.



TRACKING TRACKSIDE PROGRESS 2020

WERNER STATION

story by Joe Schnyder
photos by Dave Kulman

Joe Schnyder and Dave Kulman just finished another 110 feet of concrete ties through Werner Station. Photos show Joe watering down the ballast and rinsing off the station platform on a nice 92 degree sunny day.



TRACKING TRACKSIDE PROGRESS 2020



SAWMILL

**story and photos
by Pete Pennarts**

This is the tie cutting and assembly area that we have been talking about remodeling for a long time. With the help of Matt Rockwell and others, we finally got it done.

THANKS guys.



story and photo by Joe Schnyder

Down in the sawmill, a nest has been made in the rafters right above the fan that blows air on the people working in the sawmill. One problem is there are eggs in the nest, so we should not bother them. The other problem is that, when the fan is on and the birds have to do what they normally do on my windshield and all over my car, that is, when the PIDDLE hits the fan, the only thing you can do is **get out of the way, fast.**

TRACKING TRACKSIDE PROGRESS

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ARNTCHOO MAINLINE

story and photos by Joe Schnyder

This is the inbound Arntchoo track from Arntchoo signal bridge to Harnish Valley, where I finished putting down plastic ties to replace the track that had been down for about 18 years; where the Arizona sun had dried the ties out and the short screws have let this curve go to wide gauge. I am almost ready to tie the north end into the start of the curve that was replaced 3 years ago. First I will be letting it sit and grow for about 7 days to reach a rail temperature of 135 degrees, and then I will go out at about 3:00 in the afternoon, cut the rails, bolt it together and start ballasting the track. As soon as the ballast is down, we will get water on it to hold the rail growth to this temperature. The railroads in this area heat the rail to 135 degrees before they put the anti-creepers on and spike it down during replacement of a rail. Right behind the spiking machine, a ballast compactor comes along and vibrates the rails to reset the ballast if the ties had been replaced. At MLS, I tamp the ties, and my tamping gun vibrates the ballast just like the prototype machines do, and then we use water to hold the rail expansion to this level. It has now been leveled, tamped and ballasted down to Seagraves switch, and I am hoping to have it done by the second week in June, but with the temperatures holding above 105°, it sometimes takes longer to do. This section is 22 panels of 20 foot length, that's 440 feet of 50 plus years of strong track for the next generation to run on.



TRACKING TRACKSIDE PROGRESS

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TERMITES and WOOD ROT

story and photos by Joe Schnyder

This picture shows Dave Kulman just after we pulled the track out of the GRADE crossing on East Werner just by the adobe tower. The ties had gotten termites and wood rot. As you can see, some of the ties were not even in the panel because of the rot. This had a pan in it and held moisture which made a good place for rot and termites to breed. Because of the vehicle traffic across it, we replaced it with plastic ties and added extra guard rails to help distribute the weight of the wheels over the crossing. The reason it was replaced is because the heat pushed on the rails enough to let the outside rail open up and, as I went over with the loaded water car, it pushed the rail enough to let the wheels fall into the middle and it just rolled the rail wide gauge. The 142 gallon water car seems to find any bad spots in the curves, considering it weighs about 1300 pounds. The plastic ties should keep that from ever happening again.

Here is a tie I took out of New Diehl city and it would not hold a screw any longer because of the termite damage. Thankfully it was replaced with a plastic tie and I hope the little buggers dull their teeth on it. Over 75 percent of the ties in this switch were to the point they would no longer hold screws, so it was replaced with plastic.



TRACKING TRACKSIDE PROGRESS

2020

NEW DIEHL CITY

story and photos by Joe Schnyder

Here is the east switch at New Diehl City on the Bobberg division. These are the new plastic ties cut from the 2x4 plastic material that we purchased last year. We now have the switch fixture redesigned by Bill Lowe to make the spacing of the ties at 4 inches between each edge of the tie. This will give adequate support to the rail since all the switches are now steel rail and give the club more switch ties for our switch tie placement project. The other wood ties lasted about 14 years, but we have had trouble with lateral movement of the rails in the turnout side of the switches because the ties have dried out from the Arizona sun and summer heat. Having them covered up with ballast has made them double their life in the track. With plastic, we are hoping for a 50-year return on our investment, and the manufacturer believes we should get that plus more because of the UV chemical in the plastic. One of the big advantages of this plastic is that with time, the ends of these ties will not dry out and split like the wood does, which is why

we have wide gauge in many switches now. There are 19 switches to be replaced on Far Flung Division, since all of them have small screws and wood ties. There will be many times that the branch will be closed for switch replacement, so please watch the board for route closures before leaving Adobe Yard. With all of this work being done, I will keep 3 routes open at all times to make sure that, if you come out at night or during early morning to run, you have plenty of track to run on. We have to keep the track open to where we are working, so remember that the red sign or red flag will be to your right side as you approach. Please do not pass the red flag as the track just might be gone with a big open hole to fall into. We need to get our work trains right up to the area where we are working, so we can use air tools and equipment at the site of repair. **THANK YOU** for your attention to this. Here is the new switch for New Diehl City that I hope to have installed soon to replace ties that the termites just loved to eat, to the point that the screws could be taken out with your fingers. The other end of this has already been done and has all new steel rail and plastic ties for longevity.



STEAM LOCOMOTIVES BOILERS

DOMES LIDS and OPENINGS

by Dave Griner



Hello there, and so goes another month. Hoping all is well with everybody. This time we're going to look at steam dome lids (covers), the last major part of the boiler.

Here we have the dome opening, showing the securing studs and the gasket surface.



This is a "blind" cover, indicating it has no openings for safety valves or other things like the whistle.



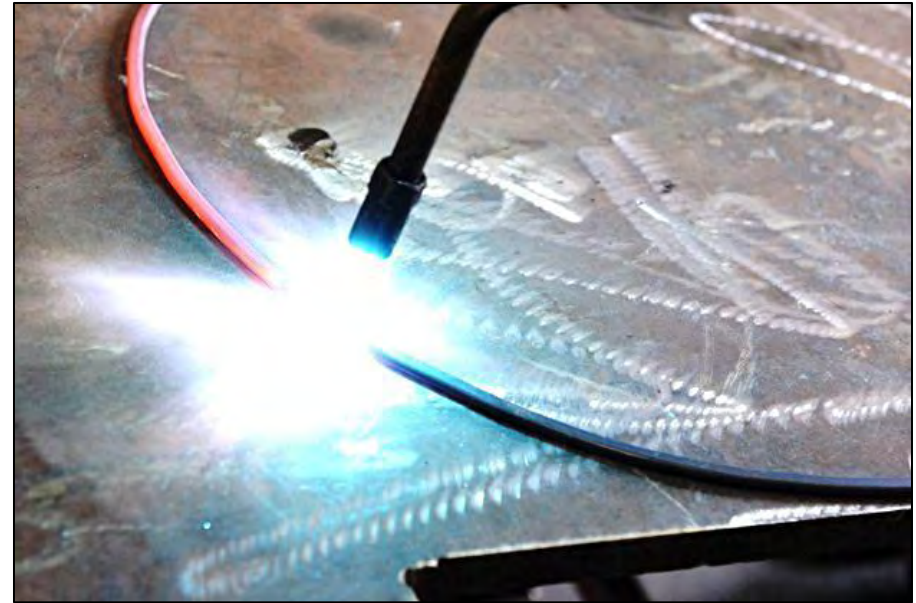
This cover has several openings and, as such, needs to be thicker due to the reduction in strength caused by the reduction in the amount of material due to the drilling out of the noted openings. The thickness is also impacted by the geometry, hence the raised section.

(continued next page)

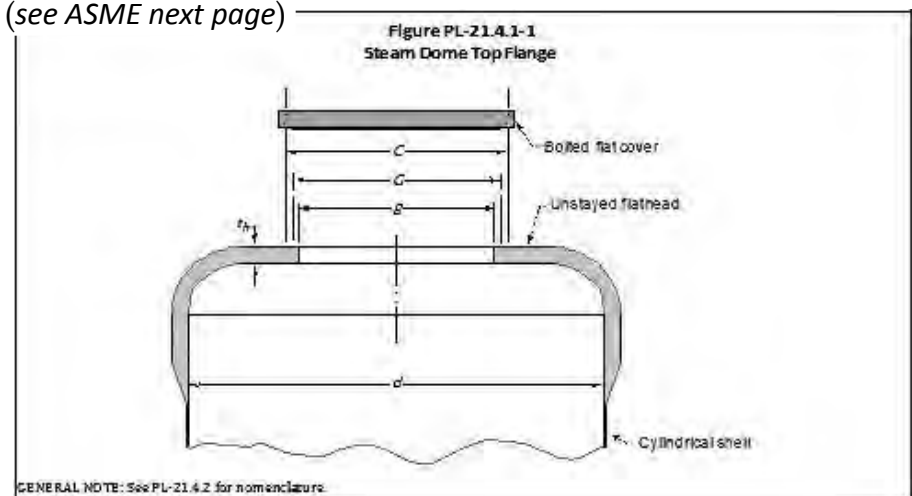
DOME LIDS (cont'd)

Here is the copper gasket ring being annealed (*right*). Typically these are made of round rods, 1/4 to 3/8 inch diameter. The rod is bent around a piece of plywood at the appropriate diameter and then the ends are welded. After completing this work, the ring is annealed to provide easy compression into the seats of the cover and dome. Usually a ring can be reused two or three times at the most, then it will have become flattened to the point where it takes excessive torquing of the studs to gain a steam tight seal.

Here we have some fellows cinching up a cover (*below*). Notice the “cheater” on the end of the ratchet, indicative that the ring has become flattened beyond optimum use. When using a new ring, we use a torque wrench and socket, bringing the nuts down to 205 ft/lbs for a 7/8 inch stud in a crossing pattern. As always, a good clean gasket surface is required.

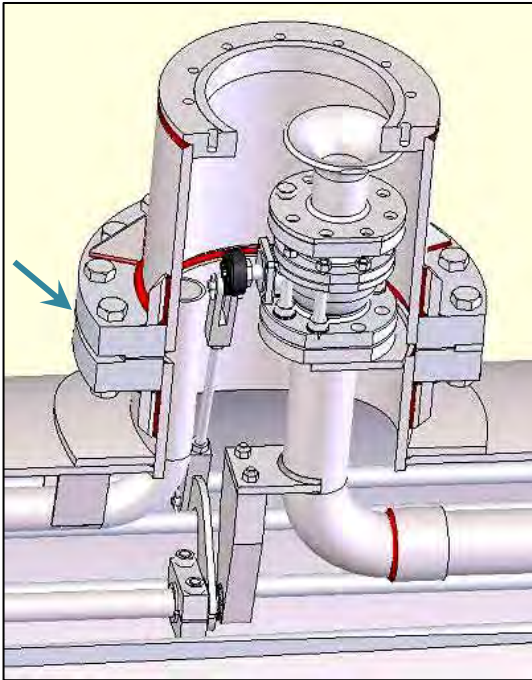


This is the diagram (*below*) used in the ASME Code, Section I, Part PL for determining how thick the cover needs to be. I was not able to lift the complete set of equations, so this will have to suffice to give you some idea as to how critical this cover is to the safe functioning of the boiler. (*see ASME next page*)



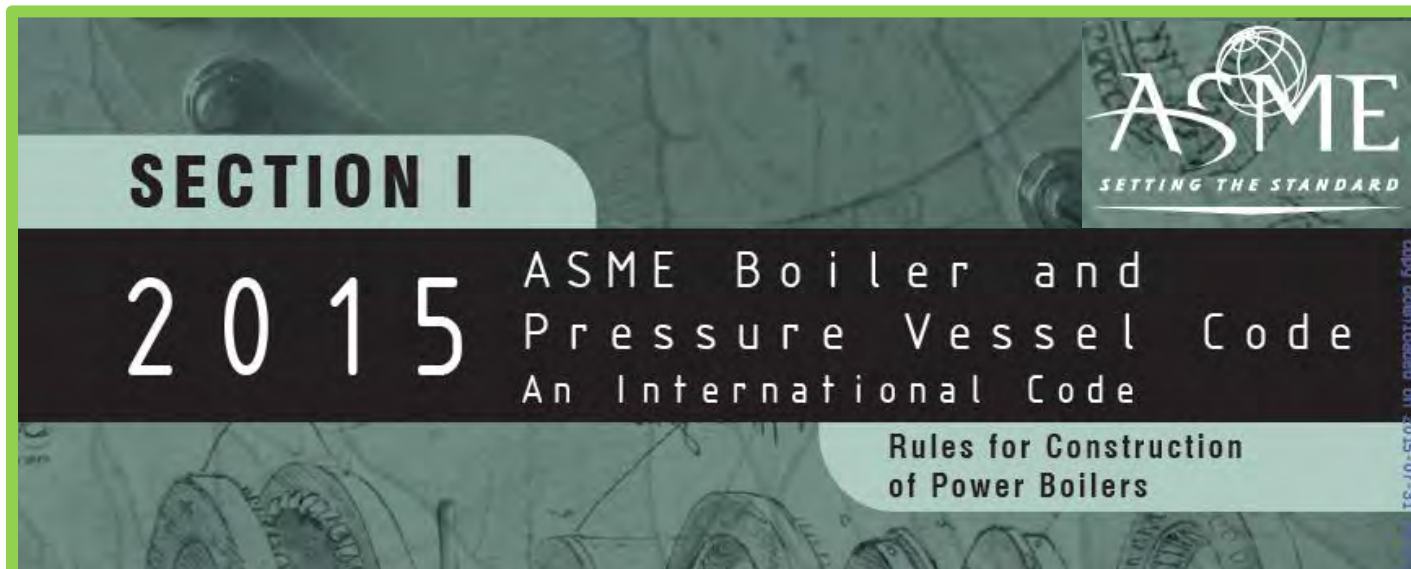
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DOME LIDS (cont'd)



Here is the better way of designing a dome (*left*). This is a split dome, very popular in the rest of the world, especially Europe. Makes access to the throttle much easier, and you don't drop near as many tools into the boiler!!

'Til next time, take care. — Dave



CLICK TO OPEN DOCUMENT: [2015-ASMEboiler&PressureVesselCode.pdf](#) – 15MB

Part PL is on pages 197 – 221 of the PDF, with all of the formulae of which Dave speaks being on pages 203 – 205. I'm sure if you need further assistance with those formulae, Dave would be willing to help you. Send an email to: dgriner@arizonaengine.com to arrange a phone conference. Thank you.

If per chance the link above is lost or not working below is the webpage address to MLS' Google Drive where this document will reside for anyone to access at any time. It is shareable, so anyone can simply copy and paste this web address into any internet browser for instant access.

<https://drive.google.com/open?id=1S2gJUvqBViJXfjfIBCVPxq8yLkEVPQnk>

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ROLLING BACK HOME

Steam locomotive boilers have not been built in the United States since 1952. Well, not exactly. They have not been built in the same numbers and sizes, but they have been built. When the 1952 edition of the ASME Locomotive Boiler Code — Section III of the Boiler and Pressure Vessel Code — was issued, it was the last formal Code acknowledgement of steam locomotive construction. The “L” stamp was retired, and eventually the nuclear folks absconded with Section III.

It was felt by all that any steam locomotive boilers could be built in accordance with the current Section I, Rules for Construction of Power Boilers, and that is where matters have stood until 2015. This July, Part PL, Requirements for Locomotive Boilers, made its debut in the latest edition of BPVC Section I.

As the decades passed since the demise of the original Section III, many boilers have been built and put on steam locomotives. These were mostly smaller affairs that would never see many of the service demands that their ancestors did in the heyday of steam railroading.

Old Is New Again –
 For the first time since 1952, rules for construction of locomotive boilers are addressed in the ASME Boiler and Pressure Vessel Code, in a new Part PL.

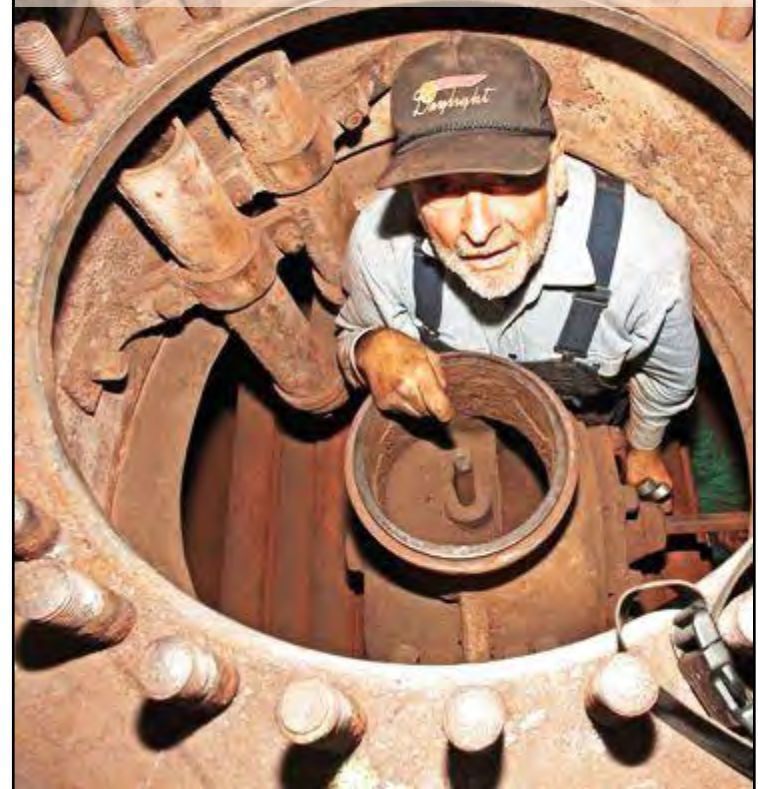


By Linn W. Moedinger

Ed. -- I found this article very interesting, after all that Dave has taught us about STAYBOLTS, which seems to have been a motivating factor behind Part PL in the ASME code.

This article is reprinted for educational purposes only, among the members of a charitable organization interested in the history of railroading. No copyright infringement intended.

**After more than 60 years,
 Steam Locomotive Boilers get a
 place of their own in the ASME CODE**



Bill Habjan, a volunteer at the Oregon Rail Heritage Center, works in a locomotive's steam dome among the auxiliary dry pipes and main dry pipe. This is where steam passes from the boiler to the cylinders. *Photo: Bruce Miller, Cooper Mountain Photography*

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ROLLING BACK HOME

by Linn W. Moedinger

(cont'd)

As the decades passed since the demise of the original Section III, many boilers have been built and put on steam locomotives. These were mostly smaller affairs that would never see many of the service demands that their ancestors did in the heyday of steam railroading.

Once in a while a boiler did find its way into “normal” railroad service and some did not fare very well. Additionally during this period, the Code rules advanced to provide sound guidance for the construction of higher and higher pressure boilers that utilized an ever-increasing number of advanced materials.

Design margins came down as it became impractical to keep boilers in service for the historically common longer periods simply because technology was advancing quickly enough to make a perfectly sound boiler obsolete long before it was worn out.

This is where we begin to see the need for steam locomotive boiler construction rules. In the railroad heritage industry, people expect a new boiler to last as long as their old one did — one hundred years not being uncommon — and they expect to be able to use it just as hard as it was originally designed to be used. It will not become obsolete other than by its own accord.

Prior to 1950, boilers for steam locomotives were built in the United States using primarily lower carbon steel products. Riveting was the joinery of the day with some minor experimentation with arc welding. Staybolts were made from wrought iron or very ductile steel and they were invariably threaded through the sheets.

Flanging was required to form the various shapes necessary for the riveted lap seams used in circumferential seams and firebox seams. Plate strength commonly ranged from 55 ksi to 65 ksi and flanging was done both hot and cold. Rivet seams needed to be caulked after riveting and hard sheets were not amenable to that process.

One of the curious things about locomotive boilers is that they work at all, especially the bigger ones. If you think about it, attaching a steel box rigidly to a steel box with steel or iron rods doesn't seem like such a great idea considering the mean temperature of the inner box will be 300 degrees hotter than the outside box and that both boxes are subject to wide thermal swings that can sometimes be rather abrupt.

The new Part PL, Requirements for Locomotive Boilers, just like the rest of the ASME Boiler and Pressure Vessel Code, has the potential to become an international standard.

After all, it seems that nostalgia for older forms of travel, especially rail travel, may be universal. Clearly, there has to be substantial interest to support all the activity in retro railroading.

Entering “heritage railroad” in an online search engine turns up an abundance of information.

In the U.S., there are more than 250 heritage railroads in 47 states and Puerto Rico. There are more than 30 old-time railroads across Canada.

The steam-powered railroads range from former logging and mining lines to short lines and newly constructed tracks for historic equipment. Some operate in public parks; others are privately run nonprofit systems staffed by dedicated volunteers; and many, including the Ghost Town and Calico Railway at

Knott's Berry Farm in California, are commercial tourist attractions.

Heritage railroads operate in dozens of countries around the world on all six habitable continents. They include electric railways, trams, trolleys, and funiculars. But the majority of the world's heritage railroads are devoted largely or entirely to the age of steam.

We couldn't find a heritage railroad in Antarctica. The closest one we could identify was the End of the World Train in Tierra del Fuego.

RAILROAD
HERITAGE

ROLLING BACK HOME

(cont'd)

by Linn W. Moedinger

Obviously, something needs to give, and that something is the staybolt. It bends. Often. Eventually, it breaks and you replace it. In the early days, wrought iron was used for staybolts exclusively and this stuff was very flexible. Later on, ductile steels were used instead of iron.

Larger locomotives made it evident that even the most flexible material would not hold up in the extreme distances from the mud ring, and the flexible staybolt was developed to help cut down on breakage. Staybolts were threaded into the sheets, bucked and hammered to expand into the threads to make a steam-tight joint. If the staybolt material was harder than the sheet material, the metal in the sheet deformed and the harder staybolt had a tendency to oval the hole in the plate during service as it tried to bend.

Welding was just beginning to be discussed in railroad circles as diesels came into favor. The subject of the staybolt became irrelevant and was dropped. As the "normal" boiler world embraced welding, steam locomotives kind of came along for the ride and took advantage of the easier construction methods that welding afforded. Usually these methods worked before higher strength materials became the norm. Probably the first problems arose in the repair field as riveted plates were replaced with much harder material that did not lend itself to riveting.

Welded staybolts mitigated the hardness differential between stay and sheet material, but the change also deleted the requirement for a key feature that monitors the staybolt. That change was a very bad idea for steam locomotive boilers simply because the feature, known as a telltale, is the best indicator of when the staybolt breaks.

A telltale is a 3/16-inch diameter hole on the longitudinal axis of the staybolt. This hole can be drilled from each end at a distance of no less than one-half inch beyond the water side of the sheet, so as to include the highest stress area of the staybolt. Hollow staybolts have the hole all the way through, which is preferable.

When a staybolt cracks, it typically cracks on one side only. Once this crack reaches the telltale hole, leakage will be observed and the staybolt can be replaced before it breaks completely off and throws all the pressure load on adjacent staybolts.



The Southern Pacific 4449 locomotive is maintained by volunteers at the Oregon Rail Heritage Center. Gary Oslund has been primary welder since the 1980s.
Photo: Bruce Miller, Cooper Mountain Photography

ROLLING BACK HOME

by Linn W. Moedinger

(cont'd)

Square corners in fireboxes are easy to make but they impede circulation and often lead to a staybolt pitch problem on the wrapper sheets in the front and rear. This led to much thicker sheets being used than would otherwise be necessary which could increase the weight beyond the limits of the frame. It became quite common for firebox sheets to be the same thickness as wrapper sheets in order to minimize the number of stays used. Staybolt diameters grew to accommodate the larger pitch. All this led to far less flexibility in the firebox and much poorer heat transfer through the thicker sheets.

A key element that disappeared with the 1952 Code was the 7,500 psi stress limit on staybolts. This limit served the railroad industry well and was an acknowledgement that the stays did indeed bend and that minimizing the tensile stress tended to lengthen the staybolt's service life, especially when a stay broke between inspections and the stress was thrown onto the adjacent staybolts.

On the flip side, some advances in materials were not accommodated by the successive Boiler Codes. A great example is the roof sheet calculation that began life predicated on a safety factor, or design margin. At some point the design margin became fixed at 5 and eventually was dropped altogether and the number 11,000 was substituted based on the assumption of 55 ksi steel and a design margin of 5. This was changed in Section I subsequent to a Code change request early in this century.

Other changes were made in Section I to the point that it appeared steam locomotive boilers needed their own home again. Some have questioned why a modern code should address this arcane technology. The simple reason is that steam locomotives operate in densely populated environments where the need to ensure safe boilers is paramount. Millions of people ride behind and stand next to these things every year.



A view of the throat sheet and lower outside portion of the combustion chamber (*above left*) shows staybolt sleeves and caps. Crown sheet and roof sheet (*above right*) are supported by an array of crown stays.

OR&N 197 undergoes restoration work at the Oregon Rail Heritage Center in Portland (*below*).

Photos: Bruce Miller, Cooper Mountain Photography



**Something
needs to
give,
and that
something
is the
staybolt.**

**It bends.
It breaks
and you
replace it.**

ROLLING BACK HOME

by Linn W. Moedinger

(cont'd)

Secondly, real working knowledge of what these boilers see when in service and how their various structures work together while bouncing down the track is not too prevalent. Since the late 1950s, there has been a growing knowledge base about locomotive boilers, but it has been pretty much outside the mainstream boiler industry. It had become such that it was quite possible, if not probable, that a perfectly reputable "normal" boiler shop could legitimately build an unsatisfactory steam locomotive boiler in accordance with the Code and with all good intentions.

When the ASME formed the Subgroup for Steam Locomotives, the intent was to get this special information in print. That subgroup has taken the approach of codifying both best

practices and Code material from steam days. Additionally, we have attempted to meld modern technology into the process where that technology has been tested and proven.

While this may seem to be a once and done process, it is far from that. People worldwide are tinkering with, building, and operating steam locomotives. Many countries advanced the technology beyond what the United States did because they waited much longer to dieselize.

The new locomotive code, Part PL in Section I can truly be looked at as a beginning. New materials and methods will now have a place to be vetted within the unique perspective of steam locomotive operation so as to ensure safe steam locomotive boilers for centuries to come.

LINN W. MOEDINGER, president and chief mechanical officer of Strasburg Railroad, is chair of the ASME BPVC Subgroup on locomotive boilers.

The Subgroup on Locomotive Boilers was formed in 2010. Four and a half years later, its work was published as Part PL, Requirements for Locomotive Boilers.



- 1. Strasburg Railroad** (www.strasburgrailroad.com) is a short-line RR established in central Pennsylvania in 1832. In the 1950s, the RR was rescued by a group of investors. This heritage RR today runs 5 steam engines and 1 diesel over 4.5 miles of track between Strasburg and an Amtrak station in Paradise, PA. Strasburg RR also hauls freight for local customers, often using its steam locomotives. The group offers its restoration services to other organizations.
- 2. Cass Scenic RR State Park** (www.cassrailroad.com) in West Virginia runs Shay steam locomotives on a rail line built in 1901 to bring timber from the mountains to the town of Cass. Many passenger coaches are remodeled flat cars that were used to haul logs. The line rises 4,800 feet to Bald Knob, third highest peak in WV. The train travels on a switchback and occasionally climbs a grade of 11%. The 22 mile roundtrip takes 4:30 hours. Exhibits at a museum along the way include a Lidgerwood tower skidder.
- 3. OR Rail Heritage Center** (www.orhf.org/oregon-rail-heritage-center/) is a museum established to house 3 historic steam locomotives that had been donated to the city of Portland. It took thousands of volunteer hours over 30 years to get 2 of the engines operational. A third locomotive, the Oregon Railway & Navigation 197, is still being restored. The tracks at the heritage center connect to the Union Pacific RR's north-south main line to enable excursion trips. The center also houses other engines and freight cars.
- 4. Illinois Railway Museum** (www.irm.org) in Union, IL northwest of Chicago, claims to be the largest RR museum in the country. In addition to electric & diesel equipment, the museum has 25 steam locomotives, 2 of which are operational. The facility includes ten equipment storage barns with a total of about 2 miles of track under cover, 5 miles of track for excursions and a depot that dates to 1853.

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OFFICIAL PUBLICATION

ROLLING BACK HOME

by Linn W. Moedinger

(cont'd)

CODE THE
WRITING RULES

The ASME Boiler and Pressure Vessel Committee on Power Boilers (BPV I) maintains Section I of the Boiler and Pressure Vessel Code, rules relating to pressure integrity governing the construction of power boilers and high-pressure, high-temperature water boilers.

At the request of the locomotive boiler industry, BPV I formed the Subgroup on Locomotive Boilers on Feb. 10, 2010. Chaired by Linn W. Moedinger, president of the heritage Strasburg Railroad, this subgroup was assigned the duty of developing new Section I construction rules for locomotive boilers.

In 4-1/2 years, the subgroup has completed its task, and the publication of the new Part PL, Requirements for Locomotive Boilers, is included in the 2015 Edition of BPVC Section I, Rules for Construction of Power Boilers, published on July 1, 2015. — UMBERTO D'URSO, ASME project engineering advisor, Secretary, ASME BPV I



Cass Scenic Railroad State Park in West Virginia follows an old logging line that rises 4,800 feet in 11 miles. Its Shay No. 5 engine, built by Lima Locomotive Works for the Greenbrier and Elk River Railroad, entered service in 1905. Photo: J. Mueller

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(cont'd)



(above) The front end of a smaller locomotive where there is no superheater header.



(right) A manufacturer's model of a double Belpaire boiler, which was being considered by the Pennsylvania Railroad at the end of steam.

Photos courtesy Linn Moedinger



(left) Restorers work on a superheater header. The viewer is looking from the front of the smokebox toward the front flue sheet. *Photo: Bruce Miller, Cooper Mountain Photography*

(right) No. 2600 was one of three articulated camelback locomotives built in 1907 by American Locomotive Co. for the Erie Railroad. Designed to handle grades in the Allegheny Mountains, they were replaced by larger engines in the 1930s. *Painting by Unknown*



HAPPENINGS PAST!



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YouTube catalog

Click on the Title Box below
to view Stan's 12-minute Train Ride along
Bobberg and Far Flung Flats Subdivisions.

You must click on the **blue FOLLOW LINK** button
when the "LEAVING FACEBOOK" Window pops up.



(above) Camera operator Zack is setting up
the shot for actors Laura and Dale.

(near right) Dale is checking the script.

(far right) As the segment was coming to a
close, Zack changed camera angles
to take full advantage of the warm
glow our wonderful sunset.



TRINITY LUTHERAN CHURCH and SCHOOL

(www.trinitylcs.org) Litchfield Park

On May 23, we enjoyed sharing our hobby with Dale, Laura and Zack, students at the church, while they worked on a video for their bible studies class. They were using the Werner "Trolley Station" as a backdrop for their scene to keep the kids interested, and will share it with other schools that wish to use it. Can't wait to see the finished video.

Story and photos by Hank Gallo

THIS MONTH THE EDITOR HAS A SPECIAL TREAT FOR YOU


This is a tribute to Joe Schnyder, Bob Douglas and all of the other Track Team members who slave over the rails each year to keep the routes open for us to safely enjoy. I wish I could list all of their names.

These videos show how the prototype railroads battle the same rail, tie and ballast problems that we have, and how important the Track Team members are to the railroad. Heartfelt THANKS to Joe and Bob and the others through the years.

I also thought the snow would be refreshing to those suffering the 100+° heat. Two of our members, Dean and Paul Fillmore, live in Anchorage and Wasilla, Alaska.

Each of these 1 hour videos is 1.5 GB, which takes 20 mins. to download if you have cable-based internet access.

If your internet modem relies on wifi to access the internet through a cell tower or satellite, your download speed is probably much slower.

Please click the link to bring up the internet window. If your browser is too slow due to the size of the file, then you will have to click the download icon . When the download is finished, you can open the video in Windows Media Player or similar software.

- [ALASKA RAILROAD-part1-1hr.dvr-ms](https://drive.google.com/file/d/1WETbNd_iwtEppOuG2UKFjPlq8gdfd-hb/view?usp=sharing) https://drive.google.com/file/d/1WETbNd_iwtEppOuG2UKFjPlq8gdfd-hb/view?usp=sharing
- [ALASKA RAILROAD-part2-1hr.dvr-ms](https://drive.google.com/file/d/1-xF9p1pMau6j8O7DuhVkTy42YDQ3EOxc/view?usp=sharing) <https://drive.google.com/file/d/1-xF9p1pMau6j8O7DuhVkTy42YDQ3EOxc/view?usp=sharing>
- [ALASKA RAILROAD-part3-1hr.dvr-ms](https://drive.google.com/file/d/16OG18h8gPPOeu1u8W7TKcLENKuHVRVa4/view?usp=sharing) <https://drive.google.com/file/d/16OG18h8gPPOeu1u8W7TKcLENKuHVRVa4/view?usp=sharing>
- These are shareable links on our Goggle Drive.

TAKING DOWN THE "LIGHTS" DECORATIONS

Story and photos by Hank Gallo

With the lock down in March, we never finished putting away all of the lights from the Megatree and leaping arches. Several members came out to put away the lights and build a new storage area.

THANK YOU for the help team! We are discussing Holiday Lights 2020, and what it might be like if we're still social distancing in November. We were short on help last year. We hope to see more of the members this year – it's Christmas.



ZA'VION's PAGE

Story and photos by Hank Gallo

Ed. – Hope the readers don't mind.

Za'veion seems to be the only one having fun at the Park these days.

Besides, he's the only one who sent me photos. I wish others would, too.

On May 23, we enjoyed sharing our hobby with Dale, Laura and Zack while they worked on a video for their bible studies class. Za'veion was there with his Chessie train for all 3 hours, exploring the "Tanks Alot/Myerstown" area while they were using the Werner "Trolley Station" as a backdrop for their scene. Za'veion found that my wrenches fit perfectly between the platform boards in the station. I'll have to bring my screw gun to gather them up later. He had a nap before we left for the park, but we hadn't made it to Pinnacle Peak Rd yet and he was asleep. Never saw his bath water so muddy.

- 1. Checking track to confirm that it's level side to side.
- 3. Enjoying Knorrstown Cemetery, named after founder and first mayor Tom Knorr.
- 4. It has been said these chairs have been haunted for Halloween.

There was a sighting of a space man there last Halloween.

- 6. I can't find the firebox in this cab.
- 7. Time to say goodnight to Zoo Tower.
- 9. Za'veion borrowed a tie car for his personal dining car, which we reconfigured before returning it to the siding.



MARKETPLACE!



From the Desk of: Perry McCully — Facility Administrator
Subject: **FOR SALE:** Raptor Toy Hauler RV Trailer w/Train Room
– 36 ft. long, 12 ft. wide, fifth wheel, 3 axle, two slide outs –
It has cooking pots, silverware, coffee pot, bedding,
and all you need is the food to go have fun. \$18,000.
Contact Perry McCully pmccully3@cox.net to look or buy.



