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STEAM IN THE GARDEN

Vol. 16, № 4
Issue № 88

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

Articles

Departments

FRONT COVER:
Hung Ta's Accucraft K27 on Robert Dunlap's railroad in the foothills of Golden, Colorado. This backyard layout is very impressive. No other neighbors close by... just surrounded by natural beauty. Very peaceful. You can enjoy the chuff beat from your engine, mixing with the songs of wild birds. You could not get much closer to the real thing! ***photo by Hung Ta***

Editor
Ron Brown

Faithful Assistant
Marie Brown

CAD & Other Drawings in This Issue
Charles McCullough • Dan Rowe

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Charles & Ryan Bednarik	New Jersey
Paul Blake	Australia
Tom Bowdler	New York
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Check out our new web site at http://steamup.info

CALENDAR OF EVENTS

Southern California Steamers - contact Sonny Wizelman for dates, places and any other pertinent information. 310-558-4872 ● sonnyw04@comcast.net

10 – 14 August, 2006 - Rail Fans Weekend 2006, Flint, Michigan. The Michigan Small Scale Live Steamers (MSSLS) are extending their most popular steam-up to a 4 day multi-location event! Come run on two of the area's largest raised layouts and spend 2 days steaming at Crossroads Village and Huckleberry Railroad. Steamers get a free, after hours, ride behind #464, one of only two working K-27s in existence. While you're in the area, visit historic Durand Union Station. Then stop by the Steam Railroading Institute, home of the real Polar Express, the Pere Marquette 1225. Lots of unique shopping in the area for the non-steamer as well. For additional information, download our flyer at: http://www.mssls.info/railfans.pdf Contact us directly at: steamers@mssls.info or visit our web site: http://www.mssls.info

31 August, 1-3 September, 2006 - The Pennsylvania Live Steamers will be celebrating its 60th anniversary over the Labor Day Weekend beginning on Thursday August 31st and running through Sunday September 3rd, 2006. We invite all live steamers and their families to come and celebrate with us.

Hot lunches, snacks and soft drinks will be available all day. Breakfast and dinner will be on your own with a good selection of reasonably priced restaurants nearby. We plan to have a catered pig roast on Saturday evening. The cost for dinner will be $12 per person. Dinner seating will be limited to the first 150 persons.

Registration: $5.00 per person for the entire weekend. Spouse and children under 16 free. Each registrant will receive a commemorative 60th anniversary pin, name tag, and information packet upon arrival. Early registration is STRONGLY RECOMMENDED so that meals, parking and camping can be anticipated.

THE DEADLINE FOR REGISTRATION IS AUGUST 11TH, 2006

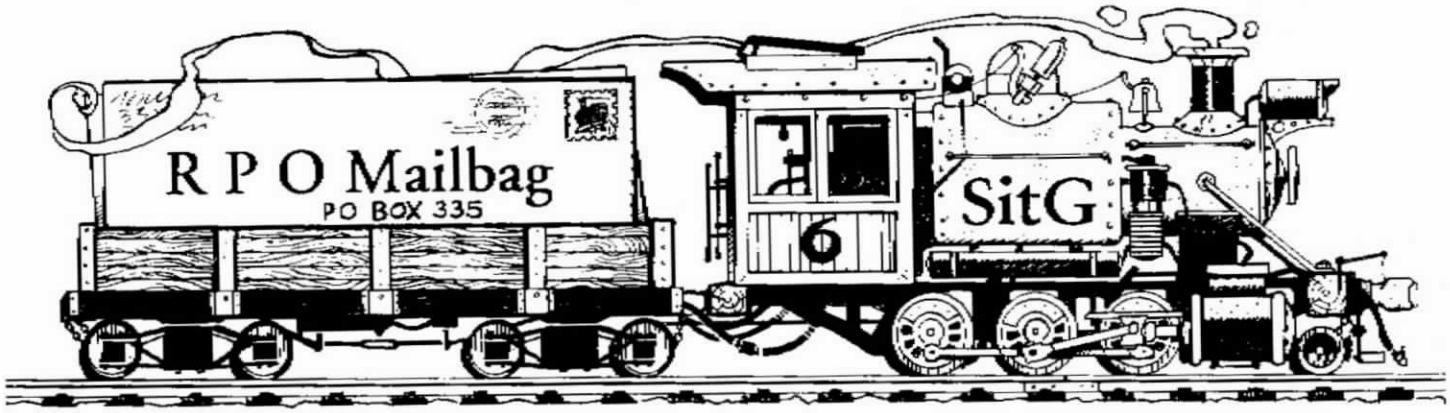
Boilers with a gross internal volume of 50 cubic inches or less and with an operating pressure of 60 psig or less are exempt from the PLS Boiler Inspection Standards.

Contact Harry Quirk at 610-346-8073 or e-mail harryquirk@netzero.net More information can be found at http://www.palivesteamers.org/Anniv.htm

The registration form is at http://www.palivesteamers.org/RegistrationFormLOGO2.pdf

22-24 September, 2006 - Finger Lakes Live Steamers Second Open House of the Year. See listing for June 23-25 for full information.

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



Letters from readers are welcomed and encouraged. Offer advice, encouragement, suggestions or constructive criticism. Tell us about your current project (and don't forget the photos!) or just share live steam experiences. But please keep your letters to a reasonable length so everyone has a chance to use this forum. Letters may be edited for length or clarity. Send your letters & photos to: SitG, Dept. RPO, P.O. Box 335, Newark Valley, NY 13811, USA...or e-mail to <rbrown54@stny.rr.com>.

* * * * * *

Australia
via e-mail

Hi Ron,

Now that I have a few minutes spare from running the ER&CM I'll have my pet whinge.

On receiving SitG #86 I see on the front cover a maroon English locomotive. On page twelve a history of a twelve inch to the foot English locomotive. On page twenty-two a test report of a Gauge One English locomotive. That's seven pages of an excellent American magazine devoted to English locomotives. If I'd have wanted to read about English locomotives I'd have bought an English magazine.

You may gather from all of this that I dislike English locomotives. Well, yes. Give me a nice Virginian 2-6-6-6 or 2-10-10-2, or the N&W 2-6-6-4 or 2-8-8-2, or a Shay or Climax in their various classes and I'm a happy man.

To my mind the English locomotives are way over rated and look as though they are battery powered. For instance , where's the air pump and its piping? I understand that one particular English locomotive has to have the boiler lifted to replace the air pump air filters!

Why are English locomotives painted those funny colours? You know...red, green, etc. Aren't they ripe yet? As a bloke named Ford once said, "You can have any colour just so long as it's black!"

Well, Ron...I think I'll just duck behind this tree till all the flack goes by and things settle down a little. B-)

Excellent magazine by the way. Particularly Charles McCullough's and Dan Rowe's articles.

Keep your steam up and your boiler water clean.

Best wishes,
John Simon

* * * * * *

Nebraska, USA
via e-mail

Ron,

As you know, I got an Aristo Craft Live Steam Mikado and really like it a lot. If your readers get one of these fine engines, they might like to find some kindred souls for advice/encouragement. I think I'm the only owner of one in Nebraska! I've found some good helpful information at the following sites:

http://steamup.info/ Steam in the Garden's new web site is at this URL, you can find good steam info here and expert help. Be sure to check Swap Shop ads for great steam buys!

http://groups.yahoo.com/group/AristoLivesteam/ Don McKay started this up. Now has over 27 members(as of 12 June). I found them quite helpful on some minor problems I needed some advice on. Lots of pictures posted also. Check it out and join up! Free site to join.

http://www.aristocraft.com/ Aristocraft, who makes the Mikado, has a good web site. This takes you there, then go to 'forums', where you will find a special forum for the live steam Mikado. Lots of good info to glean from it. Sign up, if you are not a member. Free site to join.

http://www.mylargescale.com/forum/ My Large Scale has lots of forums, one of which is Live Steam. You will find lots of good info/help/advice there also. Of course, some of us are members of all 4, so you may see some repeats. MLS has a good search; you can search within the live steam forum for postings about the Aristo Mikado and have it all at once. Joining is free. If you want, you can pay to move up to a 1st class membership, which has extra privileges, like posting photos, etc, doesn't cost much either.

I think one or any of these will add to your enjoyment of your Aristo Live Steam Mikado, so try out at least one and keep going back.

Jerry Barnes
juking@atcjet.net

* * * * * *

Nashville, Tennessee
via e-mail

To the Editor,

There are established names for every part in a steam engine and I commend Charles McCullough (Valve Gear - Part ll) for sticking with accepted terms for valve gear despite feeling that some parts should have been named something else. I occasionally call things names they weren't meant to have myself! Everything we've carried over from full size practice has a name and I think folks benefit from learning the proper terms from the start. Of course we have names they never dreamed of, such as chicken-feed burner or Goodall valve for instance!

The main purpose of this letter is to call attention to an attribute of the slide ('D') valve not mentioned in the article which for most small scale live steamers provides a great deal of benefit. As you probably know, the purpose of cylinder drain cocks is to allow cylinders to be purged of accumulated condensate, water. Water is theoretically incompressible, so if a slug of it is trapped in a cylinder against a moving piston with no escape, something has to give and since only a small percentage of Ga1 live steamers have functional drain cocks a potential for damage, however slight, is created.

But unlike the piston valve, the typical D-valve is not "captive." That is, while in operation it can be raised off its seat by a force greater than the steam pressure forcing it down. If the quantity of condensate is greater than the clearance volume at the cylinder end the piston will force the condensate out and easily lift the valve from its seat by hydrostatic pressure acting upward against the underside of the valve. In the absence of drain cocks or relief valves this allows the cylinders to purge themselves before any damage can occur - a very convenient feature of this valve.

The condensate escapes through the exhaust passages where it (and the excessive steam oil you've used) exit the stack and end up on your carriages and shirt! A nuisance, yes, but a pleasant nuisance and a very small price to pay for avoiding damage to the cylinders or motion.

To facilitate this lift a very small amount of vertical clearance is normally designed into the valve yoke.

The piston valve, on the other hand, is captive and can not be lifted off its seat. Therefore it is not self-clearing and will not allow condensate to pass back through the exhaust passages, thus cylinder relief of some kind is needed. As Charles points out, there are advantages and shortcomings to each type, but as steam pressures and piston speeds rose in the 20th c. the piston valve was found to have advantages which caused locomotive designers to prefer it over the slide valve, and they of course had the necessary advantage of being able to install drain cocks or relief valves on everything.

Harry Wade
Nashville

* * * * * *

Dripping Springs, Texas
via e-mail

Ron...

The answer to the valve gear puzzler in Figure 1 ***(Valve Gear - Part I, by Charles McCullough - issue #86)*** shows the piston in the center of the cylinder and the crank pin at 90 degrees. This is not possible because of the angularity of the connecting rod. The shorter the connecting rod, the greater the error. Shays have a connecting rod to stroke length ratio of 2.5:1 to 4:1, making this error greater than the typical rod engine.

Cheers,
Dan Rowe

WHAT'S NEW?

Quisenberry Station is pleased to announce the development and production of the following new products: A new type of butane fuel can adapter that alows the modeler to utilize either quick disconnect fittings or the traditional "press down on the Ronson valve" fitting to fill their model's butane fuel tanks. Six versions are available to cover all the commonly used "Korean", screw on (Primus type) , or Gaz fuel cans. The adaptors attach to the fuel cans and allow for one handed fueling of your model. Also available are new replacement drain valves to fit both the lubricator drain and overflow/blowdown on various Accucraft models. **Please email or call Royce at Quisenberry Station for more details. Royce@quisenberrystation.com • phone 703-799-9643**

Quisenberry Station is now a dealer for Spektrum digital radio systems and accessories. See our review of this fantastic new system in SitG № 86. **Please email or call Royce at Quisenberry Station for more details. Royce@quisenberrystation.com • phone 703-799-9643**

Cabin Fever Expo - 2006

by Charles Bednarik

Cabin Fever 2006 wasn't Diamondhead, but the live steam community enjoyed the opportunity to steam together.

The history of Cabin Fever and its steam related products celebrated its 10th year with great participation by hobbyists involved with many different facets of live steam. The event is spear headed by Gary and Jared Schoenly, along with the women behind the success.

Presentation of special boxcar to Mike Moore. L. to r. - Nick Wilson, Harry Quirk, Mike Moore, Roy Ganderton & Murray Wilson.

There were many vendors and exhibitors throughout the two massive halls. Everything from machinery for home shop machinists to operational steam engines, which included tractors, sawmill, boats, and of course trains. A large pond was set up for those who like to venture across the waters with smooth sailing throughout the event. A special day had been set aside for our live steam engines, allowing steam engine enthusiasts to run into the evening hours on Thursday.

The auction had an outstanding collection of steam powered boats, trains and engines for sale (just ask Bob McDonough...or shall we call him Steamboat Capt. Bob).

The Aikenback Live Steamers have been represented at the event for many years. The participation this year was extensive due to the cancellation of the Diamondhead International Steam Up event. In the past three years most of the area's live steam operators have ventured down to Diamondhead, Mississippi to the mecca of steam. Unlike last year with only a half of dozen steam heads, this year there was an increase in the roster of over 70 that had signed up in advance for this year's event. Members of the live steam community traveled from Canada, Mississippi, Ohio, the Carolina's, as well as along the northeast corridor from Connecticut and New Hampshire and many states surrounding Pennsylvania. The participants ranged from the very young (Josh Shapin) to the highly experienced veterans.

The turnout for this event was large thanks to Mike Moore and his efforts in coordinating with the management, tracks, R/C boats, supplies, all the little aspects that make steamups happen in a seamless way. Mike was recognized at the event for his outstanding contribution to the success of this event along with the many, many other public displays he sets up for throughout each year. The Aikenback Live Steamers had a special boxcar with a customized inscription that symbolized the appreciation of the group for Mike's dedication to live steam.

Recognition also goes to Harry Quirk for the time he put in establishing the accommodations where most of the steam community lodged after having run out of steam at the end of each day.

A very special person was among the steam crowd: Jerry Reshew. Jerry had a surprise for the

Track owner Jeff Young. Jeff is the new owner of Tom Bowdler's Mk I portable track, and he brought it all the way from Canada so the 32mm steamers would have a track of their own.

participants offering all of us a gift in the tradition of Diamondhead. Thanks, Jerry!

Another highlight during the event was the drawing for two Accucraft reefers that had been labeled with the road name Nickel Plate Road and offered by Bob Moser to Aster customers. There were several vendors there offering their support, supplies and many ways to extend our steaming experience: Jim Stapleton, Royce Brademan, Bob Pennock and Bob Moser.

With the accommodations of 5 tracks the opportunities to run our live steam equipment were numerous. The tracks of Mike Moore, Tom Bowdler, Jeff Young, McCormick brothers and Charles Bednarik made it possible to run a variety of live steam from 32 mm to 45 mm.

An interesting process that many miss is the construction and the setup requirements of each track. The tracks came by car, minivan and trailers. The track that was the most compact, lightweight and easily set in place was designed and built by Tom Bowdler. Two of the five tracks on site were products of Tom's craftsmanship. Of course the mainstay of the meet was Mike Moore's massive portable, capable of accommodating both 32 mm and 45 mm. The track with the most interest was the the McCormick's track with ballast and scenery set up for 32 mm engines.

The operation of the various steam locomotives did take a coordinated effort with the steamboat organization. Thanks to Charlie Roth and the utilization of the South Orange Seaport frequency board, the running of R/C controlled vessels did not have any conflicts.

Speaking of R/C control, Jeff Runge had his newly built Aster Berkshire under control of a new R/C unit offered by Spektrum. This unit has advantages over the older RC setups: 1) no frequency conflict due to 2.4GHz 2) Fail safe default for throttle if unit stops working 3) can be set up for 10 different engines. ***(watch for a review of this new system coming soon in SitG)***

Speaking of R/C control and steam engines, one of Roger Cutter's locos had the Airwire system installed, and it worked well indoors. Jon Kling ran his steam engines with the RCS system with success. Then there were several others having well established conventional R/C units. There were at least eight individuals at any given time on the track board using R/C to run their locomotive. Keeping track of this kept us from having unnecessary accidents (that's not to say there were not a few unrelated to R/C).

Tom Bowdler...designer, builder and transporter of the new Mk II portable (see article in this issue).

On Thursday, the facility at York allowed us to set up in advance of the show. There were about a dozen people involved in setting up the tracks, and the job was completed prior to lunch.

Having completed the setup it was time to enjoy the extended day of running. The day began with Ryan Bednarik operating Harry Quirk's coal fired K4 and Jon Kling running his C-21 while a few of us finalized the accommodations for the hotel. Though

the time frame available for running was not the 24/7 of Diamondhead, the schedule offered time for all to enjoy running their pride and joy on the rails. The group ran steam into the evening and set off to dinner about 7 PM.

On Friday, the day started with a free breakfast bar at the hotel of cereal, fresh waffles, bagels, pastry, juice, tea and of course coffee (a routine that we enjoyed each morning at the Best Western). The morning found many of the vendors taking a break to see our trains in action. For some of us it was off to the auction to look over a great collection of steam related items (the auction started at noon and finished about 7 PM- thousands of items).

Saturday was the peak of participation and audience attendance. It was wall to wall people and a full schedule on all the track boards. The variety of locomotives covered the spectrum of steam with vintage, new, custom made, narrow gauge, standard gauge, 32 mm and 45 mm on the rails.

Aster Berkshire run....Jon Kling and Ryan Bednarik.

Each of the tracks seemed to attract their own group, with Mike's having mainly standard gauge and also a few K27's due to switch clearance problems on the other tracks.

On the Bednarik track more narrow gauge roamed the rails, but there was an occasional standard gauge with an Accucraft Daylight and Aster Mikado both running high speed service.

Vintage steam - Nick Wilson's big pot boiler & train.

Speaking of high speed service, over on Mike Moore's layout there were several engines in the fast lane bidding for a "flying Aster Award." Paul Quirk's Aster SNCF 141R Mikado, Tom Rowe's Aster K4 and GS4, Roy Ganderton's Mikado, and Ryan Bednarik and Doug Glatz alcohol fired Daylights. Harry Quirk's GS4 war baby, along with Jeff Runge's Mikado rounded out the high speed roster.

A more casual speed could be enjoyed at Tom Bowdler's track, where you could hear Jerry Reshew's Ruby bash, or Jeff Young on his track with his coal fired Roundhouse Fowler. A great show of vintage locomotives was very popular on the McCormick brother's portable. Murray Wilson and his son Nick enjoyed running with them. Murray and Nick also fired excellently conditioned vintage locomotives on the tracks of Mike Moore's layout.

During the meet several newbie's to this hobby or to a large steamup found it to be an experience worth the time and money invested. David Rose got enough track time to advance his steaming skills from his prior experience with the Ft. Wilderness steam engine to firing an Accucraft K27 with ease. Roy assisted Jeff LaRue in learning about the Aster Mikado, resulting in Jeff's awaiting the delivery of his new Mikado. Barry Shapin and his son Josh ran several engines, with his son following an endless the path of not only his own steam engine but that of almost every steamer on the track (nice to see a hobbyist developing at an early age).

Barry also learned how to deal with a blower

More vintage steam - Murray Wilson's 4-2-2.

problem on his Alisan Shay. Ryan Bednarik took time from his running schedule to determine that there was a blockage and fixed it for Barry and his son, allowing for many smiles for the miles (scale that is) it made thereafter.

For the newbie's on the track there were many Aristocraft Mikado learning experiences. Bruce Shillinglaw found out several ways of improving and running his steam engine. As Bruce prepared to leave for Canada with Ted Constantine, they discussed the customs requirements they faced given the steam equipment in the car!

Of the engines that were running there were several to be noted based on their recent entry into the marketplace. The Accucraft GS4, Aristocraft Mikado and Aster Berkshire were new offerings to the hobbyists this year. The intent here is not to do a review but to give a general impression of the runs regarding each engine during this event. The Accucraft GS4 was successful for both versions, alcohol and butane. Through the trials and efforts of Accucraft they have put forth a model that will perform to standards of Superpower locomotives reflective of the real thing. The Daylight (both gas and alcohol) pulled 10 David Leech coaches and the Black GS4 pulled its coaches with ease at a scale speed representative of mainline service. The situation with the alcohol fired version seems to have been resolved with an improved axle pump, new wick material and baffle in the fire box.

The Aristocraft Mikado was able to pull with ease over 30 freight cars with some modifications. The Aristocraft Mike has had minor issues with the fuel system. Keith Hurt's engine has a gutted valve setup in the fuel tank along with a warm water/steam feed to the water bath used to warm the fuel tank. Keith's efforts to eliminate the firing problem resulted in an impressive showing of steam power. There were four Aristocraft engines at the show, and I know of two others that were purchased, indicating the popularity of this entry level standard gauge engine that will be an encouragement for new members of the live steam community.

The command performance awaited the premiere product model by Aster. There were three NKP Berkshires that graced the rails during the meet. Two were kits (Ryan and Jeff) and one was factory built with plans to kit bashed into C&O vintage (Mike Oates). The performance, endurance and quality of these Berks have well represented the last production of superpower by Lima. Whether the Berks' performance related to running over an hour, or challenged with a long drag or pacing along with a cruising speed of a fast freight engine, the impression was WOW!

The skill of engineers and the capacity of an engine to impress were not limited to the stock manufacturer offerings of the current era of steam models. Murray Wilson's 4-2-2 Beggs has aged well with care and its color scheme and coaches make for a highly impressive train. The ability to build tracks is not the only aspect of Tom Bowdler's skills (dentistry aside). His Shay is about as realistic as a backwoods engine gets. The narrow gauge engines had eye catching equipment. Bob McHale's custom Backwoods Log-

Mike Moore's turntable and view of venue at the Cabin Fever Steamup.

ging loco, the trolley/inspection car created by Carl Weaver and Jon Kling's masterful rake of cars will stop people in their tracks! The creativity was apparent both for artistic (Jon Kling) and utilitarian purpose, as with Noel Crawford's steam track cleaner. While most engines are fired either with butane or alcohol, Ed Cook fired his custom made (Ruby based) Camelback with propane. I think Ed should be recognized for the marathon award with the amount of track runs he was able to accomplish.

For me, the aspect that was most impressive were engines that offer an opportunity to operate as close to the real thing as possible. Nothing matches the challenge and routine of a coal fired engine. Three engines were out and around on the tracks during the show with a warm glow of coal in the firebox. The time and effort of a coal fired engine is different each time. For Ryan and myself, firing at this meet was particularly challenging due to my mistake of mixing anthracite (was using to make coal loads for hoppers) with the Welsh. Despite the mix of coal, careful screening allowed us to develop a good bed of coal in the Aster K4. The same result was noted for Jeff Young, even though he expressed his concern given that he had not fired with coal since Ron Brown's steamup last summer. Bede McCormick fired his black diamond eater with a good run along the rails being eased a bit by having R/C control.

The final day had a lighter attendance but was enjoyed by all who made it a full weekend of steam. Ryan and I ventured over to the boats to enjoy the soothing effect of the water. Along the way we visited various displays of steam power being utilized with steam tractors, miniature hit and miss engines, powered saw mills cutting wood along with an outstanding display of miniature appliances that could be retrofitted to a steam powered engine (e.g. old washing machine).

While this event does not offer the extensive schedule of running trains around the clock, there is much to do as one awaits their time on the tracks. The conversations were lively, the knowledge broad, the experiences entertaining and the friendship priceless. The opportunity to see skilled craftsmen and their handiwork is inspiring. The vendors with the vast array of tools, machines and supplies is endless (if you can't find it here then the next best thing is ordering from McMaster-Carr). The value of this event as a "how to" for steam machinery is what allows all of us to keep the hobby going. Especially keeping our steam engines going beyond their normal life expectancy when that one small part wearing out, which could keep all the other parts from working, thus making our favorite engine a shelf queen.

One aspect of a meet that rarely gets written about is the requirements of setting up and breaking down. The cooperation of all that pitched in to get the tracks ready and then packed away is appreciated. To coordinate a group of enthusiastic helpers at the beginning is easy but getting it all back into the correct space in one's vehicle is the true challenge. What is more impressive is to have help at the end of the day repacking the track and equipment. Many that assisted us did it for the first time with very little knowledge of how to get it done, but their efforts and patience resulted in everything in our van plus an extra few things we did not bring to the show. Thank you for all that came early and left late for getting the work detail done.

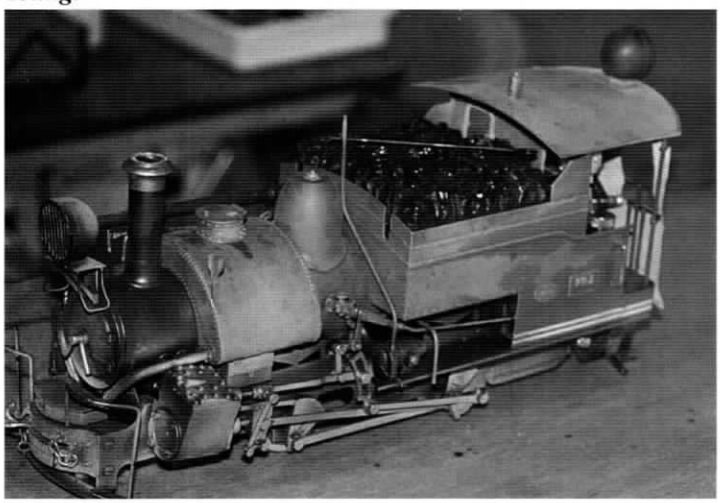
This event was unique, as are others such as the Diamondhead International Steamup. The benefits are in being there, along with the memories that carry us forward to the next big meeting-Diamondhead 2007.

Cabin Fever from a 32mm Point of View

by Jeff Young

Jerry Reshew, all the way from Diamondhead, MS, running a 45mm modified Ruby. I'll bet Jerry got more track time at Cabin Fever than he does at Diamondhead!

American Flyer gauge 0 clockwork. This one belongs to Jeff Young.



Stan Richmond's Roundhouse Darjeeling. Beautifully detailed and weathered!

This LNER 4-4-0 belongs to Bede McCormack. Provenance is unknown, but it may be scratchbuilt.

Rob Kuhlman tends a 32mm train.

The McCormack brothers...hat's Bede McCormack on the left and More on the right. They are running a coal fired Tolhurst Engineering Vale of Rheidol.

Modifying the Accucraft Shay Lubricator

by John Simon,
CEO of the Elk River & Cheat Mountain Railroad

When running my Accucraft Open-Cab Shay I noticed a lot of popping, banging and squishing as she was running, which was very off-putting. I think the Mich-Cal Shay and all Ruby variants, plus any other type that have the steam pipe on the side of the lubricator rather than through the center of the lubricator would benefit from this modification.

Also, the lubricator was empty at the end of each 30 minute run, this tells me that the amount of steam oil going through the small exhaust pipe was way too much. So... how to fix?

Looking into the top of the Shay lubricator shows a large cut in the side of the lubricator where the steam pipe is silver soldered and I had ideas of possibly putting some fuse wire into this hole to slow the amount of oil used. I even tried different weights of steam oil, ie SAE 280, 400 600. No luck!

After reading back issues of *Steam In The Garden*, reading all I could on the Forums on live steam plus a couple of phone calls to one of our resident guru's here in Australia, Gordon Watson, I decided to move the steam line on the lubricator from the side to through the centre of the lubricator. This will reduce the area acted upon by the air-spring, thus reducing the amount of oil used and stop the popping, banging and squishing.

The way I see that these lubricators work is there must be a bubble of air above the oil to operate, and when the loco is operating the pulses in the steam line as the valves open and close cause the air bubble to compress and expand thus sending a small amount of oil into the steam line with each pulse.

With the Accucraft Shay we have the full diameter of the lubricator acting as the air-spring, thus sending a fair amount of oil into the steam line on each pulse.

Here is how my Fix was done

Drain all oil/water from the lubricator. To remove the lubricator from the Shay, undo the two steam line nuts, remove the drain screw and top lubricator screw. Put the drain screw and the top screw in a safe place so they can be found easily. Using an open-end spanner, loosen and remove the long nut under the footplate that holds the lubricator in place. Put it in same safe place as the drain screw and top nut. Lift the lubricator out of the loco.

Fire up the trusty gas torch and gently heat up the steam line side of the lubricator and remove the line from the side of the lubricator.

I then found that there IS a small hole in the steam line, not a large one as I expected.

As we are going to reuse the steam line, put the steam line in the same safe place as the drain screw, top nut and hold-down nut.

The easiest way to go from here is to reuse the existing steam line, so by using a piece of copper tube with the inside diameter the same as the outside diameter as the steam line, cut a length 1" long. We'll call this the Joiner Tube.

Drill a hole .035" in the centre of the Joiner Tube on one side only.

Silver-solder a small brass patch over the existing hole in the side of the lubricator using 002" or 005" plate brass.

Turn the lubricator 90 degrees and, using a clearance drill that will allow the diameter of Joiner Tube to pass through, drill a hole on the same level as the original hole. Drill through both sides of the lubricator .

Now comes the fun part. Test fit the Joiner Tube into the lubricator. The .035" hole MUST be on the top! Assemble loosely back into the loco. Just to make sure all is correct, screw the top screw back into the lubricator to ensure there is enough room to do so. It must not touch the Joiner Tube. If it does touch the Joiner Tube then correct this by filing or, if you have a lathe, use that. I even went so far as to drill a dimple into the top nut to ensure that there was air on top of the steam oil.

Remove the top screw from the lubricator and put it back into that safe place. Remove the steam line from the safe place and cut into two pieces. You may have to remove approx 3/8" to 1/2" from the centre of the steam line to get this to fit correctly. Cut and fit one side first then the other.

Test fit the two pieces of the steam line into the Joiner Tube so that the steam has a continuous journey from the throttle, through the lubricator and into the fore-and-aft control block.

When all looks OK remove it from the loco and permanently silver solder the Joiner Tube in place with the .035" hole on top. Re-fit to loco to check your fitting.

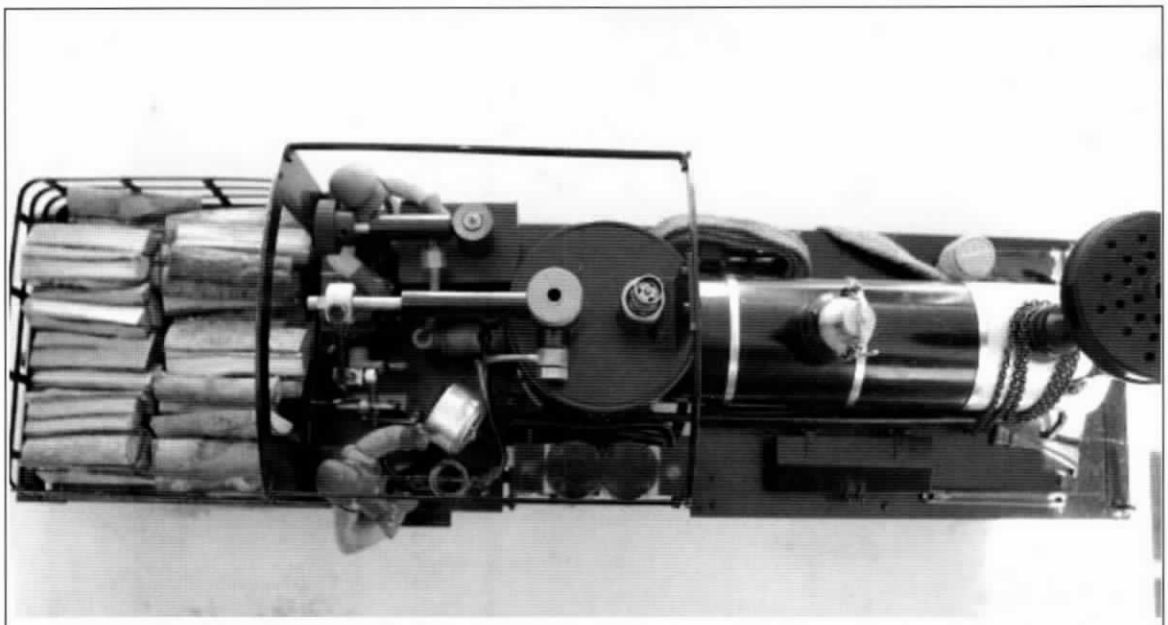
My steam line and Joiner Tube were press fits, so when I removed the lubricator from the loco I had a good idea where the position of the steam line sections would be. Also, the patch I soldered onto the lubricator was now on the inside of the loco and not visible from the outside.

When you are happy with the positioning of the steam line, remove the lubricator from the loco and silver solder the steam line into the Joiner Tube.

Wash the whole lubricator assembly inside and outside in HOT water to remove any brass chips or filings. Test for air-tightness of the lubricator to ensure there are no pin-

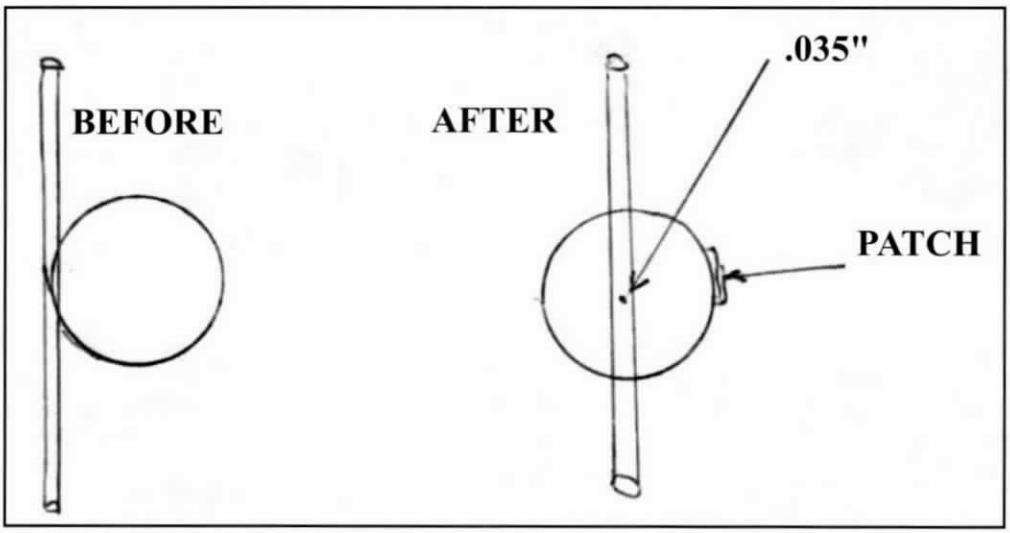
holes in the silver soldering.

Reassemble the lubricator into the loco, then connect up the steam lines and ensure that all fits correctly. A little judicious bending is allowed as the steam line has been annealed in the silver soldering process. Be very gentle here as a kink can form very easily.



Looking down on the loco – the lubricator is next to the pressure gauge.

When all is okay, remove the lubricator from the loco again and, using white vinegar, pickle the lubricator for an hour or so until all the gunk from the silver soldering has been dissolved. You may have to give it a scrub with some soapless steel wool to get some of it off. Once this is done we don't want to handle the brass work with bare hands, so grab a pair of the SWMBO's rubber gloves while she's not looking and use these whenever handling the cleaned lubricator..



Using a spray etch primer, spray the whole lubricator and steam line, ensuring that none gets into the steam line or lubricator.

When dry, spray with your favourite colour and again ensure that no paint gets into the lubricator or steam line. When dry, refit to loco, sit back and admire your handiwork for a while.

Okay...now's the time for a test run. I hope that you find as I did that your Shay is a lot quieter now and uses less steam oil.

Another modification to my Open-Cab Shay was to remove the gauze wire covering the stack, as the fine holes were filling up with steam oil blown out of the blast pipe and restricting the steam plume. To remove the gauze wire covering is not easy, so go slowly and make a series of holes in the top and slowly cut the covering away. Once the covering is removed, clean up the edges of the stack with a fine file. Mask off the top of the stack, spray with etch and repaint when dry. There is already a nice looking stack cover underneath the wire gauze covering.

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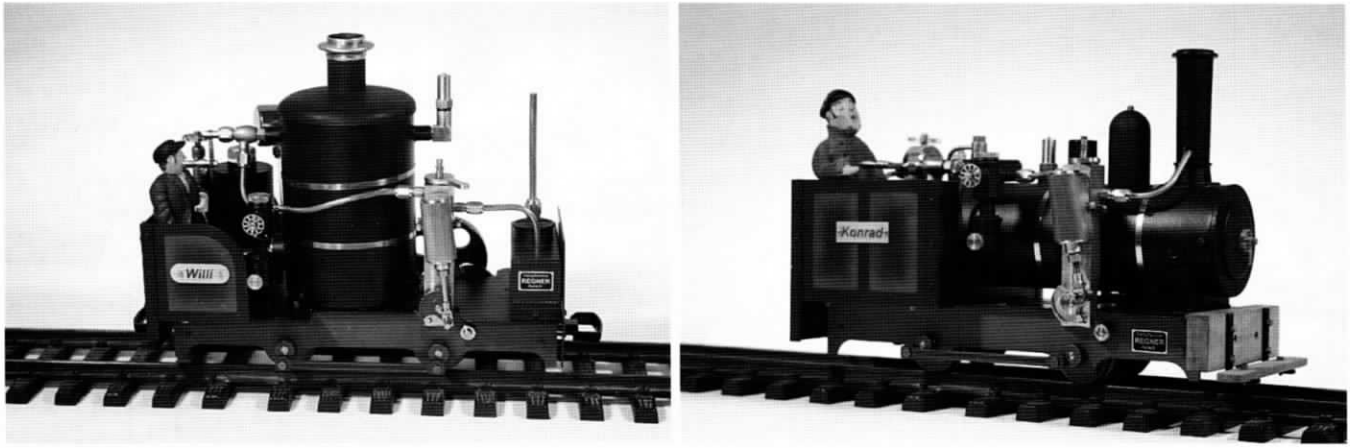

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The Special Relationship...

Forget Tony Blair and George Bush.
The best special relationship is between garden railroaders in Britain and the US...
Text by COLIN HAND (retired British Rail architect)
Photos by NANCE FYSON

"ENGLISH VISITOR SEEKS LIVE STEAM..."

It could be the kind of lonely hearts ad you'd be afraid to answer, but my intentions were honorable. I'm a retired British Rail architect living in Sussex (UK) and my partner Nance grew up in Michigan. We were due to visit her relatives and I was just curious to see anyone with a garden steam layout similar to my own. I've been on real US railroads, like the one to the Grand Canyon and the Durango & Silverton, but wanted to see American steam modellers in action.

My email to ***Steam in the Garden*** was passed to Bob Weltyk of the Michigan Small Scale Live Steamers, and he emailed back a welcome. After a further email exchange, we arranged to visit his Lake Orion garden on a Saturday in June. Bob's excellent layout is a raised oval as is often found in the UK for 16mm club test tracks. When put in an English garden, it usually belongs to someone who models 10mm scale, gauge 1 standard gauge models – which was indeed what Bob was running when we arrived. It's a superb model of a S.P. 4-8-4 with a train of four heavyweight cars to match.

A few of the Michigan Small Scale Live Steamers and their guest..... Tom Toth, Bob Weltyk, Colin Hand and Chuck VanFleteren.

Bob has recently installed the first colored light signal on his layout, which changes from clear to danger as the train passes. It then cycles through caution and back to clear (forgive the British terms) controlled by sensors at track level. He has also built a very neat water crane which is perfectly sized to refill the locos at refuelling stops. Bob also demonstrated some of the terrifically atmospheric whistles for model steam engines which he produces and sells (both to the US and abroad).

The afternoon was made all the more pleasant as more group members arrived. Steamtom 1 (Tom Myers) brought his Aster Flying Scotsman with a 10-car train of LNER teak finished coaches, and a newly-acquired Regner vertical boilered "Willi". This small, single cylinder geared "coffee pot" was seen chugging happily around the layout pulling its own three or four wagons with a 10-car LNER rake hanging on behind. SteamTom 2 (Tom Toth) ran an excellent model of a Shay logging loco similiar to an example which Bob has recently rebuilt, having obtained it in a very sad state. Reilly (Don Reilly) turned up with a vintage 16mm loco, just to make me feel at home. It's a model of the Si-

Colin Hand looks on as Bob Weltyk demonstrates his scratchbuilt water column.

erra Leone Railways Hunslet No. 85 2-6-2 tank. The prototype is now owned by the Welshpool & Llanfair Railway in Wales (their No.14). Coincidentally, we were riding behind the real thing in Wales while on holiday (sorry, vacation) there in May.

Bob's neighbor, Chuck VanFleteren was also present. However, in spite of encouragement from the rest of the MSSLS gang, he has still not seen the light and continues to model electric mice in HO!

There are certainly more similiarities than differences between us modellers on both sides of the pond. I model in 16mm scale (1:19) on O-gauge track representing the 2-ft narrow gauge lines found in the UK, on the European continent and some other places. This seems to be less popular in the US where the large-scale garden lines are either G-scale (1:22.5) representing metre gauge, or 1:20.3 representing 3ft gauge — both running on 45mm gauge tracks. All these scales are really fairly close so many items, such as lineside structures (model buildings etc), can be used indiscriminately.

The biggest similiarity is the sense of comraderie, and the way colleagues support each other with advice. The friendly hospitality of the Michigan live steamers is also something which British groups share and enjoy. My group, the Kent branch of the 16mm association, meets with our raised layouts in a scout hut during the winter. During warmer months, we all sign up to have an "open day" at our homes. Members bring their engines to run in the various gardens, and there are plenty of refreshments. Wives, grandchildren etc. come along and enjoy the sunshine and company.

It was good to visit a US steam garden railroad in action. We were impressed that the thriving MSSLS has been going only since 2002 and attracted 29 members in the first few months. Unfortunately, we weren't there at a time to catch any of the busy regular events. However, having seen Bob's model of "Mudhen" which runs on the Huckleberry Railroad near Flint, Michigan, we did manage visiting and riding behind the real thing.

Tony Blair and George Bush represent a kind of US/UK "special relationship", but it's rail modellers that show international bonds at their best.

Steamtom1 (Tom Myers) breaking in his grandson's Regner Willi

Southern Spring Steam 2006

by Jim Pitts

A continuing tradition each spring and fall is the Southern Steamup. With an open invitation to the Piedmont Garden Railroads last fall, eighty or more guests attended. Some were railroad enthusiasts; all were lovers of Southern barbeque. If you feed them, they will come.

Invitations to the Southern Spring Steam 2006 was limited to live steamers and serious explorers of the fine art of boiling water in Gauge 1 locomotives. Again, barbeque was the noon centerpiece. However, the primary focus along with renewing friendships from across the years and miles was fueling, firing and running Gauge 1 trains.

Several Aster NKP Berkshire locomotives experienced their initial runs. While operating on test rollers is satisfactory for tuning, nothing replaces track time for the true test of the machine and the builder. Smiles were in abundance. Commendations and congratulations sealed the success of projects well done.

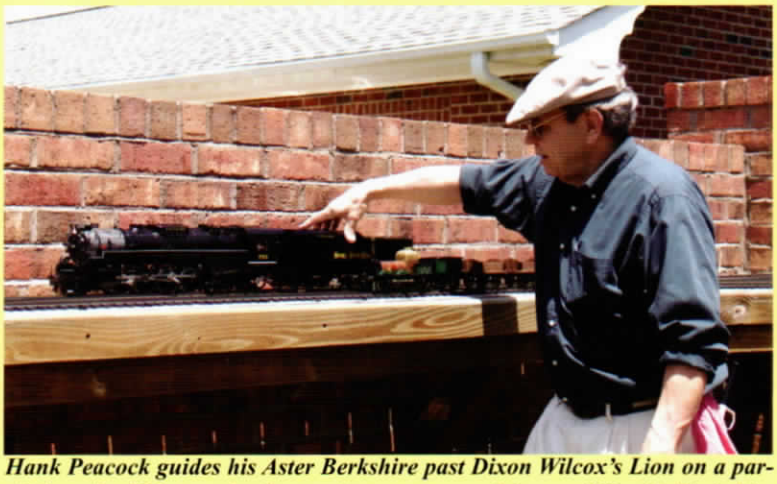
Attracting several dozen live steamers from the Carolinas and Georgia, the Southern Spring Steamup also included live steamers from Illinois, Utah, and as far way as Munich, Germany. Locomotives ranged from Aster Berkshires, Moguls and Lions, to a Beck Helene and an Accucraft Ruby, and even Jon Walker's PuttPutt boat.

Under the shade of a dogwood tree, a nuclear engineer from North Carolina, a fireman from South Carolina, and a BMW automotive engineer from Germany banded together to master the fine art of coal firing an Aster Mikado. In spite of their individual expertise, they realized that all of them were smarter than anyone of them. We laughed that firemen are trained to put out fires rather than to start them.

Steaming southern style replicates the fun and fellowship, warm hospitality and genuine helpfulness experienced at steamups across the country and literally around the world. While offering support at problem solving, the friendships forged are ties that bind us together in the tried and true technology of live steam.

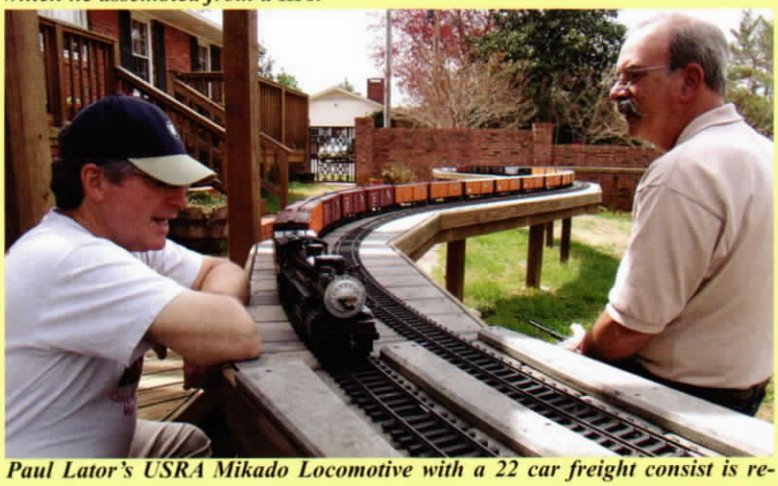
Evidence that a love of steam for some starts early and small, Jon Walker Pitts, age 3 1/2 carefully watches his putt-putt boat meander in shallow water. This combination of olive oil, fire and water creates memories from generation to generation.

Southern Steam Spring 2006

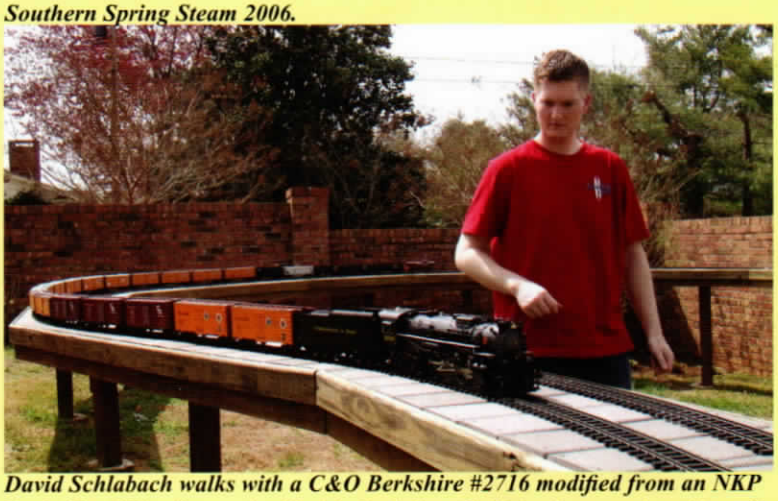


Hank Peacock guides his Aster Berkshire past Dixon Wilcox's Lion on a parallel track. This was the first and a very successful run of Hank's Berkshire which he assembled from a KIT.

Elk Hartman from Munich, Germany has a bonding moment with a 26 year old. This DB-01, an Aster classic, was manufactured in 1980. Fortunately, Elk's consulting responsibilities with BMW in Greer, SC, coincided with Southern Spring Steam 2006.



Paul Lator's USRA Mikado Locomotive with a 22 car freight consist is reviewed by Ross Schlabach. Paul customized his Aster Light Mikado to represent Southern Pacific Locomotive 3264.



David Schlabach walks with a C&O Berkshire #2716 modified from an NKP Berkshire KIT. Customized by his Dad, Ross Schlabach, operating this radio controlled Berkshire is truly a father – son "hands-on" experience.

Uwe Oberschelp's initial steaming of his recently completed BR-52 Kriegslok. After trackside tuning, its rhythmic steam exhaust brought sighs of satisfaction to the happy builder.

Jason Musheno displays a satisfied smile and a smooth running NKP Berkshire.He reports that he completed his Aster NKP Berkshire kit in 120 hours.

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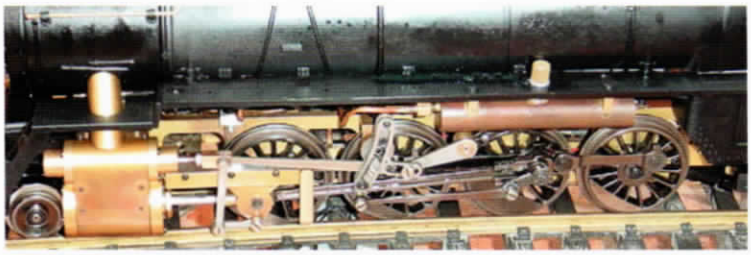

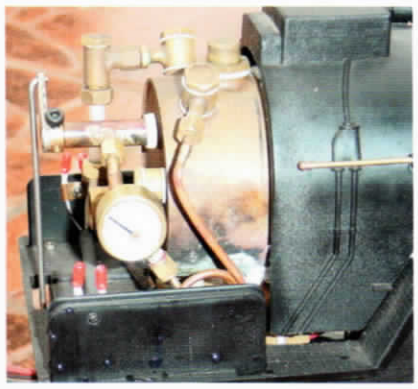

Photos are of Engineering Sample. Appearance of production model may differ. Cylinders, under frame & many other metal components will be blackened.

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The Nuts and Bolts of Shays

First Cast Steel Trucks

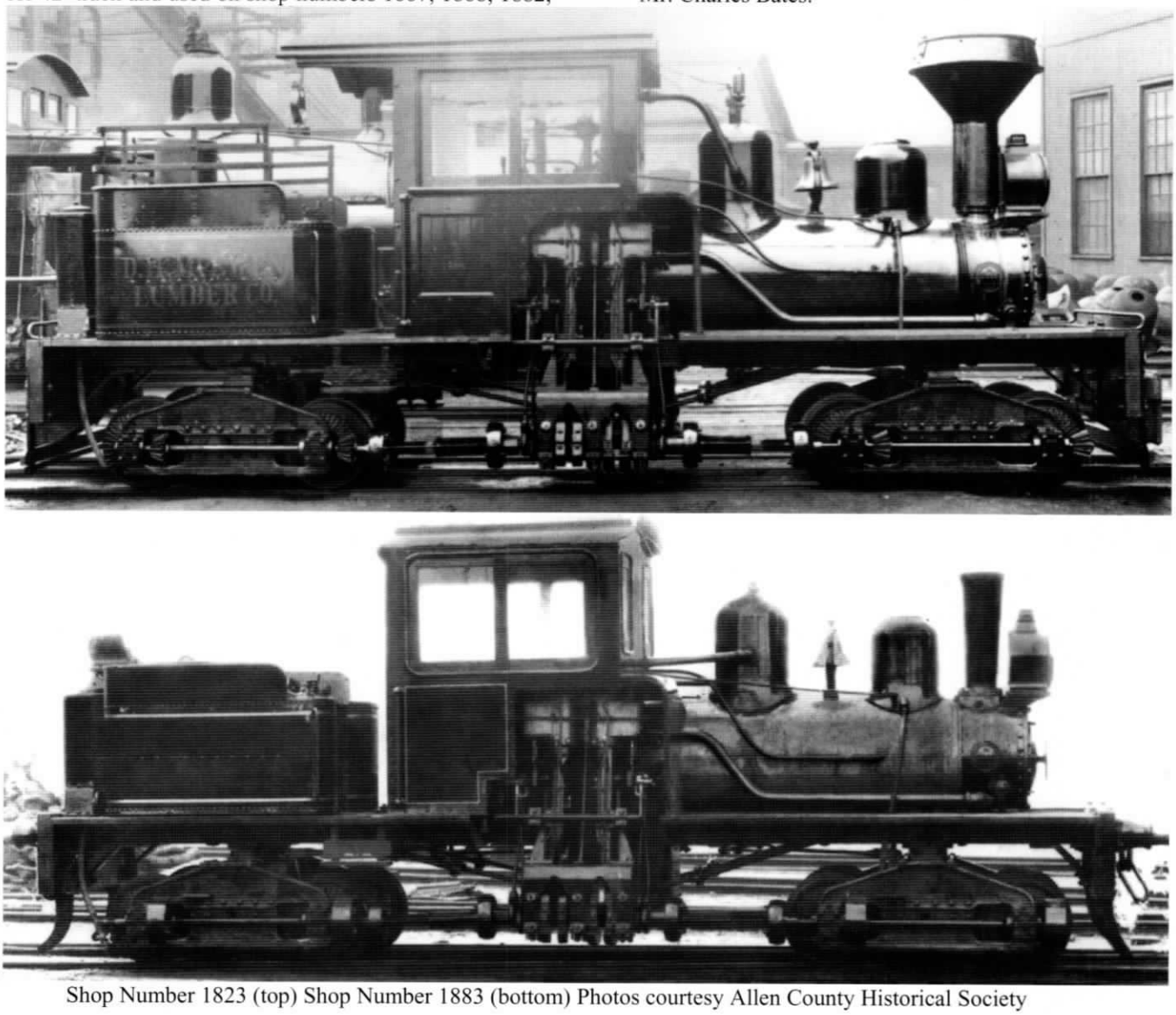
By Dan Rowe

D.H. McEwen was one of the owners of the El Dorado Lumber Co. and it is reported that it was his idea to use a cable system to cross the American River north of Camino California. The story of that lumber operation is well covered in R.S. Polkinghorn s book Pino Grande . D.H. McEwen sold his share of the El Dorado Lumber Co. before the financial panic of 1907. He took over the mill at Cazedero, CA and purchased a 36 gauge Shay, S/N 1823, from the Lima Locomotive and Machine Co. This Shay was built to plan 1553 and it had the first cast steel trucks. The side frames of the trucks were rigidly bolted to the bottom bolster casting that looks like a capital I when viewed from the top. The left side of these very sturdy trucks has an equalizer lever for three point suspension.

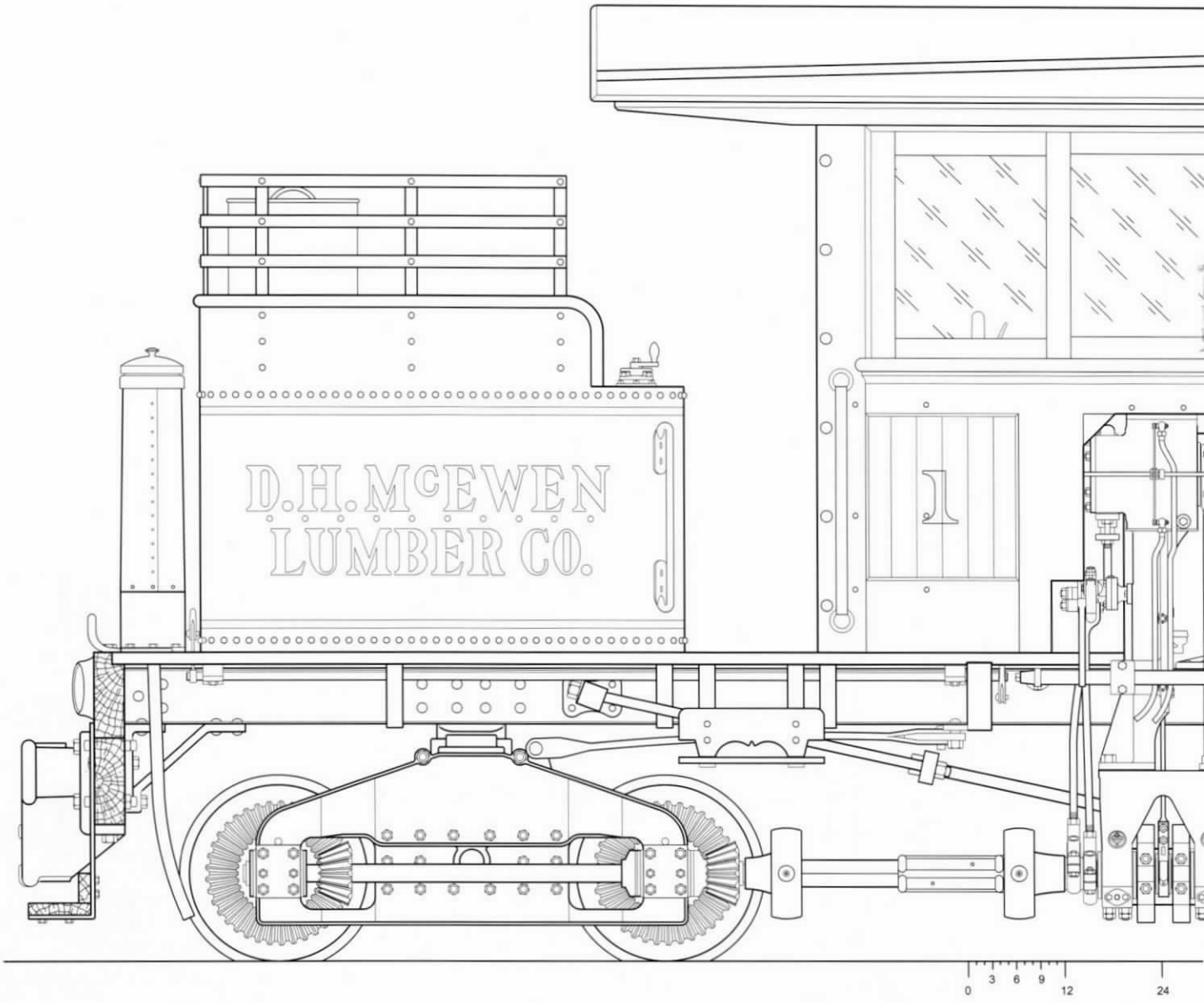
Four more sets of these cast steel trucks were gauged for 42 track and used on shop numbers 1867, 1868, 1882, & 1883. These Shays were shipped to Moji, Japan and used at the Imperial Government Steel Works. The final set of the early cast steel trucks was gauged to 30 and S/N 2001 was shipped to Yokohama, Japan also for use at that steel works.

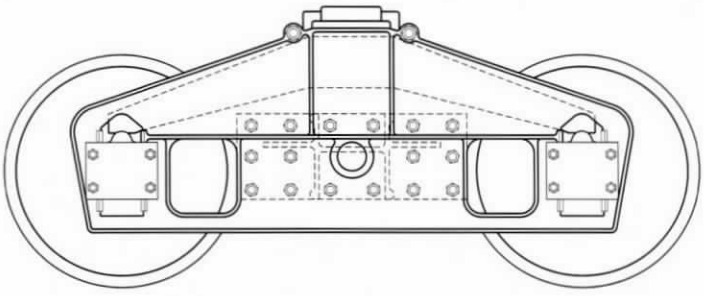
All six sets of these trucks were shipped in 1907, the banner year for Shay production. A total of 217 Shays were shipped in 1907. The panic of 1907 might have been a contributing factor for the slump in Shay sales; only 89 were produced in 1908.

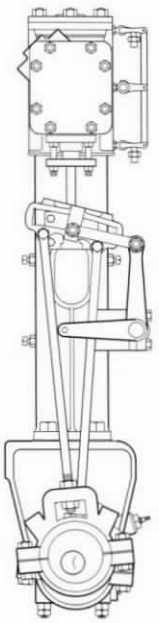
The frame details and the frame brake rigging are shown on the plan drawing. Plan 1553 is LLW drawing 16205. This drawing and all the builders photos used in this series are obtainable from the Allen County Historical Society at 620 W. Market St., Lima, OH 45801; contact Mr. Charles Bates.



Shop Number 1823 (top) Shop Number 1883 (bottom) Photos courtesy Allen County Historical Society

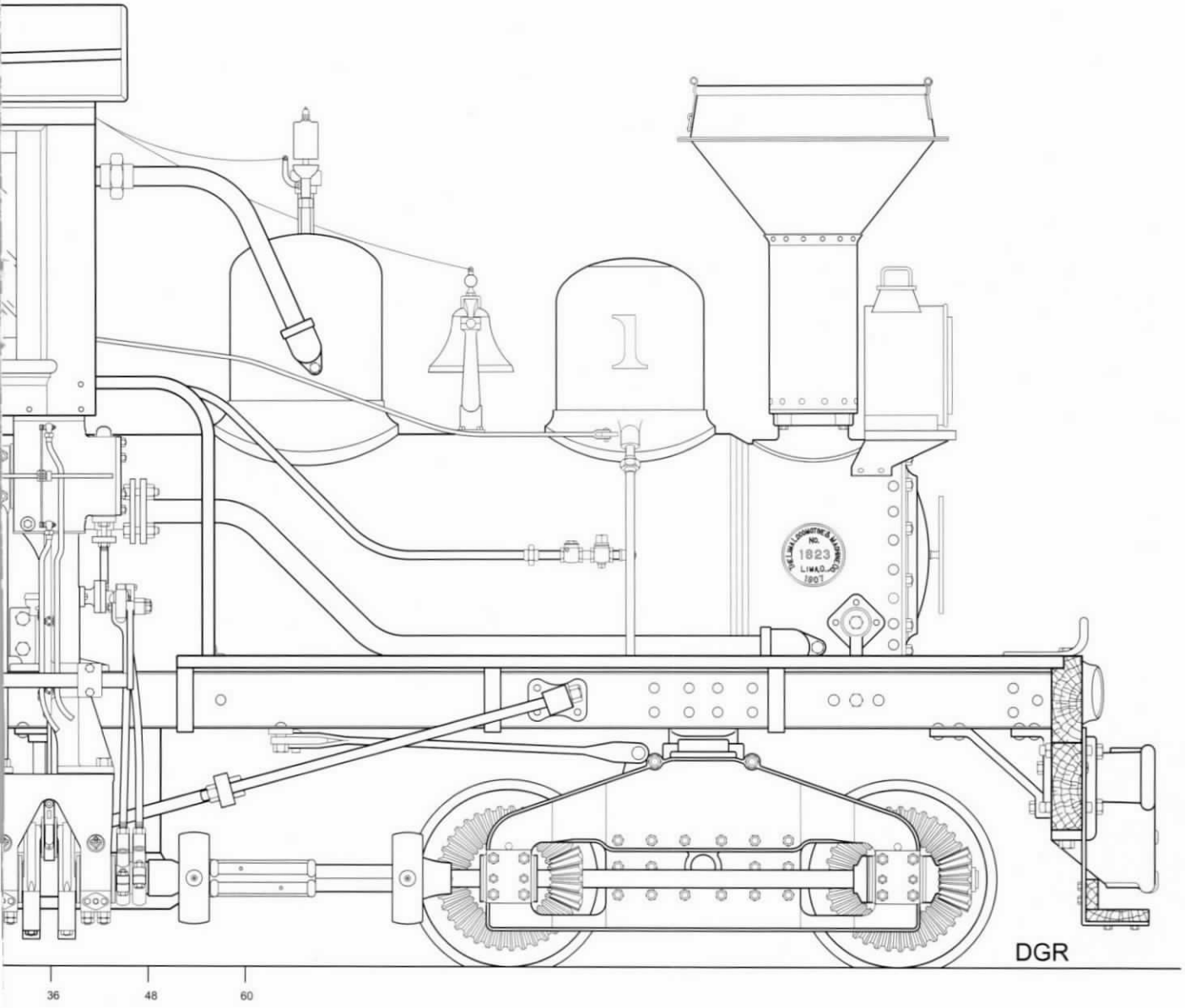






Built by the Lima Locomotive & Machine Works Lima, Ohio
For the D. H. McEwen Lumber Company Cazadero, California

Shop Number 1823	Boiler 27-1/2" Straight
Date Shipped 4/5/1907	Boiler pressure 150 PSI
Weight empty 27,600 #	Tubes 32, 1-3/4" OD, 72" L
Bore & Stroke 6" x 10"	Firebox length 25-3/8"
Driver diameter 22"	Firebox width 22-7/8"
Wood Capacity 1/3 cord	Firebox height 39-1/2"
Water Capacity 400 gallons	Gear ratio 15:37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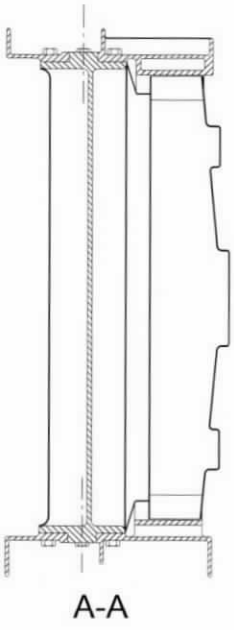
DGR
36
48
60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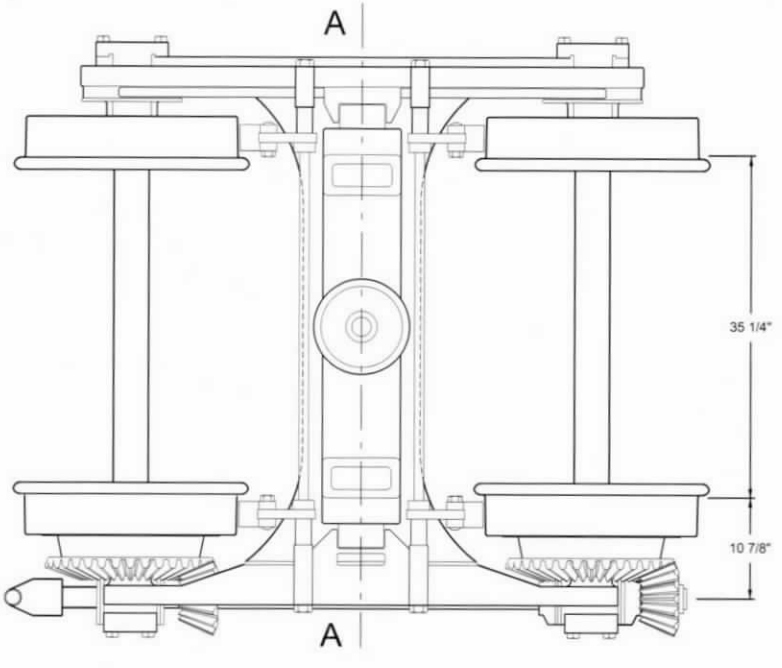
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35 1/4"
10 7/8"
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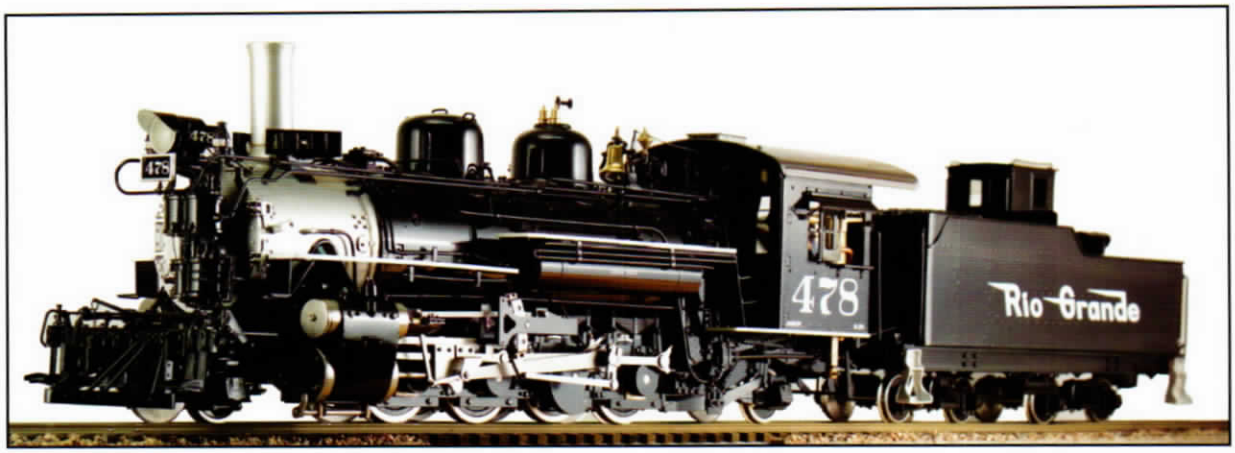
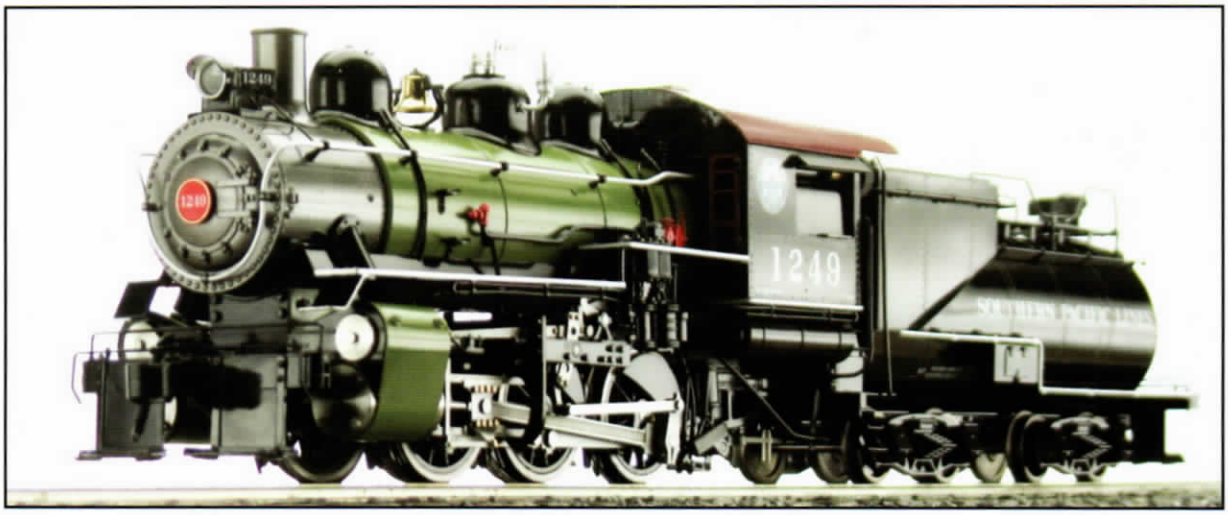
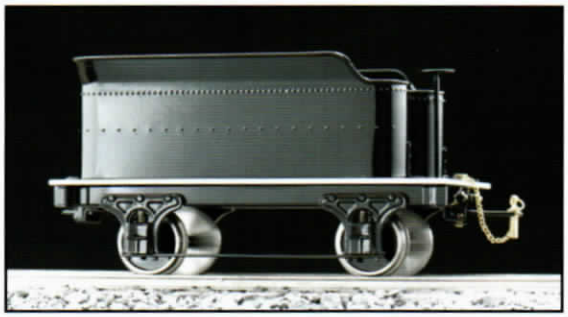
Timeless Beauties



D&RGW K-28 2-8-2, Live Steam
1:20.3 Scale, 45mm Gauge
Available Winter 2006



Southern Pacific S-12 0-6-0 Switcher, Live Steam
1:32 Scale, 45mm Gauge
Delivery in Progress



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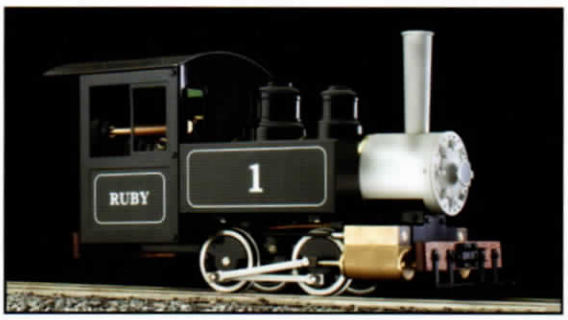

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Our DENVER Project Loco

by Ken Leach

Finding Inspiration...

SitG has been inspirational for our family. While not yet a live steamer I was prompted several years ago to order plans for the DENVER engine, which was featured within these pages. I teach vocational printing classes in Elkhart Area Career Center in Elkhart, Indiana and received tremendous assistance from Mr. Mike Young's Machine Trades Class. His students systematically machined almost all the parts for this great little engine over the course of one school year. Since I'm not a machines like my brother Richard, I relied heavily upon his expertise in metal working. He put all the parts together and made some very interesting refinements as our version of the DENVER slowly came to life. I posed out little engine out in my wife Louise's flower garden. Now we're planning a backyard garden railroad with pond and waterfall, which I hope will see some real progress this summer. SitG is a real gas! (Hot steam *is* a gas, isn't it?)

Valve Gear - Part III

text and drawings by Charles McCullough

In part 2 of this series the two most common types of valves were described and the fundamental relationship of the piston and valve positions was presented. Now we need a way to control the valve position automatically.

The valve gear for an engine that runs in only one direction is relatively simple. The valve needs to lead the movement of the power piston by some amount. Connecting the valve stem to a second point on the flywheel/drive wheel some number of degrees ahead of the power piston connection will move the valve consistently that number of degrees ahead of the power piston. The valve should be 90 degrees ahead of the piston plus a bit more, depending on the dimensions of the valve parts and the steam ports, and the specified percent of piston movement for cutoff. The major portion of this advance beyond 90 degrees is to accommodate the amount that the valve covers the port to the cylinder when the valve is centered (known as "Lap"). Every engine design is different, but considering a nominal set of dimensions and 80% cutoff, this is around 28 degrees, thus the valve connection would be about 90+28=118 degrees ahead of the connection to the piston.

BUT... if you just make one connection at that angle, the engine will go only one direction. If you want to make a locomotive go the other way you would have to turn the locomotive around on a turntable, or have a loop-back of track, or pick it up and put it back on the track facing the other way. Can you imagine the difficulties imposed on you if your passenger train overshoots the station platform?

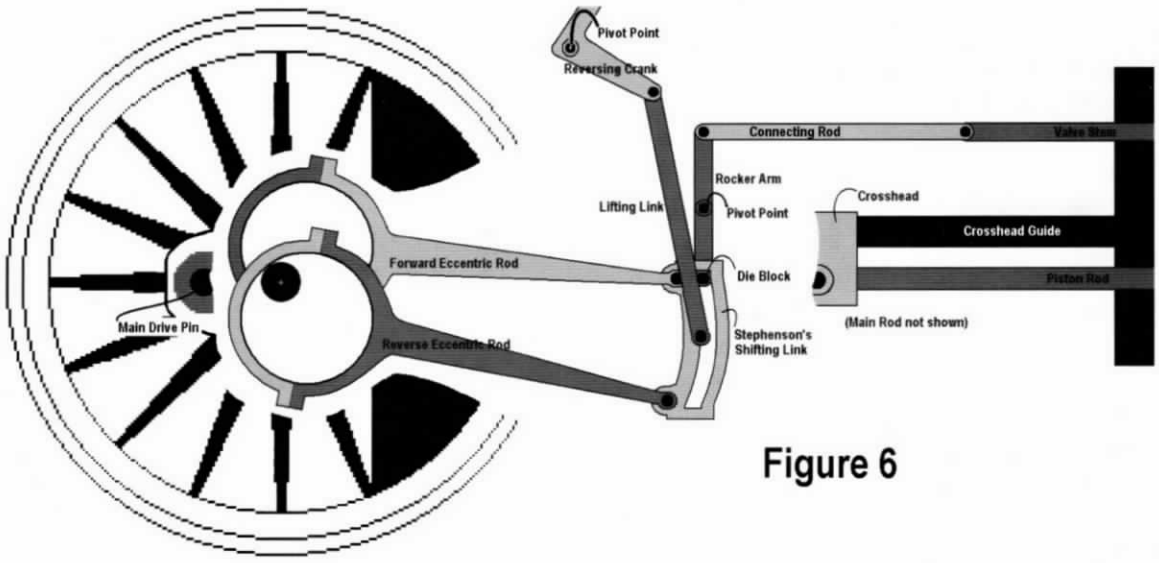

Figure 6

Getting the locomotive to reverse direction is relatively simple to accomplish without the expense of a turntable, a loop of track, or back surgery. Simply provide a second connection on the wheel the same number of degrees on the other side of the drive pin. This will make it so that all you have to do is; stop the loco, jump down off the engine with a big wrench, disconnect the valve from one connection, and move it to the other. In fact, this is how it was done on the very early locomotives! However, there is a better way.

The first purpose of "valve gear" was to provide a method to change from forward to reverse without the big wrench. A by-product of it is a method to affect the timing to increase the efficiency, but I will get to that later.

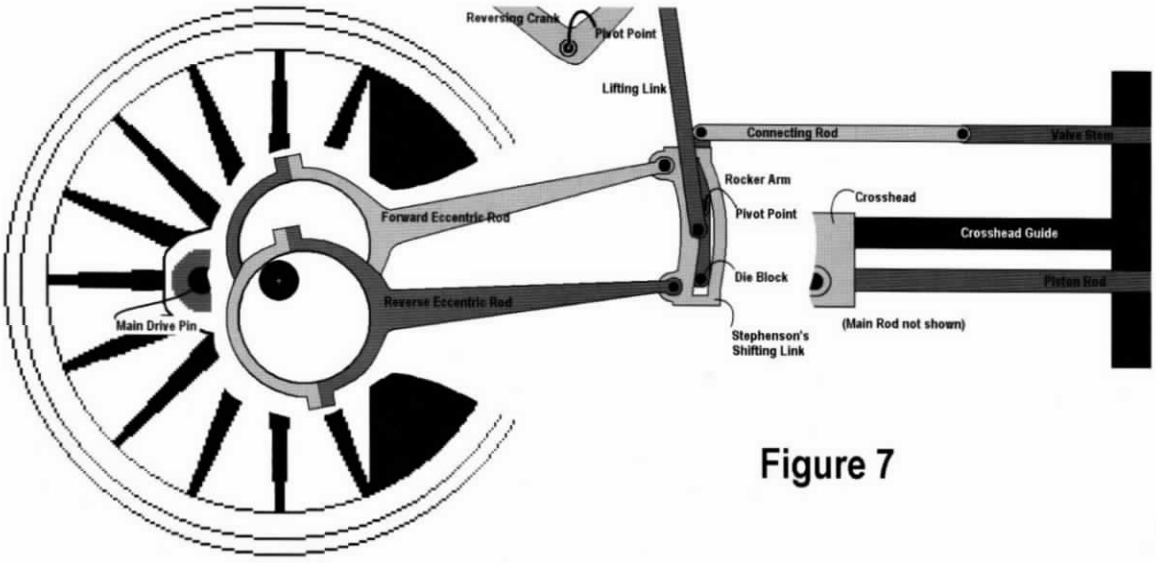

Figure 7

There are dozens of patented Valve Gear, but only a few were used to any great extent on Railroad locomotives. Many of the various types of valve gear can be understood by comparing them to what are probably the two most common types of valve gear, Stephenson's and Walschaert's.

Stephenson's valve gear (Figures 6 & 7) is denoted by using two separate eccentrics (a disk with the axis of rotation not in the center of the disk, similar to a "cam" but perfectly circular) to provide the timing. One eccentric is for forward motion and the other is for reverse. The eccentrics (two for each valve) are usually between the frame members, being mounted on one of the main axles. The angle of the eccentrics, one set some number of degrees clockwise of the main crank pin and one the same number of degrees counterclockwise, cannot be altered without crawling under the engine with heavy tools.

The "Stephenson's Link" is the roughly rectangular shaped object about midway between the eccentrics and the valve, and it has four physical connections. Two of the connections are at opposite ends of the link and go, one each, to the eccentrics. One connection, the "Link Block", slides in the slot in the link and connects to the valve stem. The forth connection, the "Point of Suspension", is used to shift the link (thus Stephenson's is also known as a "Shifting Link" type of valve gear) such that the valve stem connection is in line with one or the other of the connections to the eccentrics. The link is nothing more than a method to provide a simple transition from one eccentric driving the valve stem, to the other eccentric driving the valve stem. Since one eccentric is on one side of the drive pin and the other is on the other side, it is now simple to shift from forward to reverse and back. Figure 6 shows the Stephenson's Link set for Forward and Figure 7 shows it set for Reverse.

If the valve is outside admission then the greater than 90 degree angle is correct. If the valve is inside admission, the eccentrics have to be rotated by 180 degrees. Then, again, note that the particular design in the diagrams show an intermediate lever (Rocker Arm) used to offset the force of the eccentrics from centered with the piston rod to be centered with the valve stem, and that this lever produces a 180-degree phase shift that is compensated for by rotating the eccentrics back 180-degrees.

Table 1 lists the relation of whether the Link is Down or Up for "Forward" direction, the relation of the Eccentric to the Drive pin, whether a Rocker Arm is used, and the Admission type.

Table 1

Forward:	Down	Down	Down	Down	Up	Up	Up	Up
Eccentric:	>90	>90	<90	<90	>90	>90	<90	<90
Connection:	Direct	Rocker	Direct	Rocker	Direct	Rocker	Direct	Rocker
Admission:	Outside	Inside	Inside	Outside	Inside	Outside	Outside	Inside

The design of Stephenson's Valve Gear usually was such that "Forward" has the link in the lower position ("Down" in the chart). This is because it is

thought to be better for the link to "fall" into forward gear if the Point of Suspension were to fail. Steam locomotives do not usually run in reverse at high speeds, so if that part should break while in reverse (throwing one side of the loco into forward, thus locking things up) it would not be so bad, but if one side of the engine were thrown into reverse while traveling forward at high speed it could cause a derailment.

Table 2

Forward:	Bottom	Bottom	Top	Top
Eccentric:	Lead	Lag	Lead	Lag
Stem to Lever:	End	Mid	Mid	End
Admission:	Outside	Inside	Inside	Outside

Walschaerts' valve gear (Figures 8 & 9) is denoted by having only one eccentric and, what is known as, the Expansion Link. The eccentric is usually not a disk but rather a single crank arm at an angle off the main drive pin where the drive rod from the power piston connects.

The Expansion Link looks similar to the Stephenson's link, except it has only three connections. Unlike the Stephenson's link, which moves in relation to the valve stem to align one or the other of the eccentrics with the stem, the Walschaerts' link is fixed in location by a central pivot point, and a radius rod from the valve stem moves from one end of the link to the other to select forward or reverse. When the radius rod is at the end being driven by the eccentric, the engine goes in one direction and when it is at the opposite end, the engine goes in the other direction. Figure 8 shows the Walschaerts' Link set for Forward and Figure 9 shows it set for Reverse.

Since there is only one eccentric, if it were at that 118-degree angle, that would be a great angle for one direction, but the other direction would be 180 degrees from that due to the expansion link and thus would be at 62 degrees. This is no good. To cure that, the eccentric is set to 90 degrees, so the other direction will be minus 90 degrees. However, 90 degrees has no advance. The cure to that is to combine the eccentric angle with the angle of the main crank pin using a "combination lever".

One end of the combination lever is connected to the power piston crosshead (via the Union Link). The other end is connected to either the valve stem or the radius rod. Somewhere between the ends, the other of the valve stem or the radius rod is connected. Whether the radius rod, or the valve stem, connects to the combination lever between the other two depends on whether the valve is Inside admission or Outside admission. The relative distances between the three connections determine the combination of the angle of the eccentric and the angle of the power piston to produce the desired amount of advance.

Table 2 lists the relation of which end of the link the radius rod is in for "Forward" direction, the relation of the Eccentric to the Drive pin (for forward), where the Valve Stem connects to the Combination Lever, and the Admission type.

Similar to the Stephenson's gear, Walschaert's valve gear usually has the radius rod in the lower half of the Expansion Link for forward motion ("Bottom" in the chart). If the Lifting Link (the mechanical part used to move the Radius Rod from one end of the Expansion Link to the other) should break, the Radius Rod will fall to "Forward" gear. However, not all

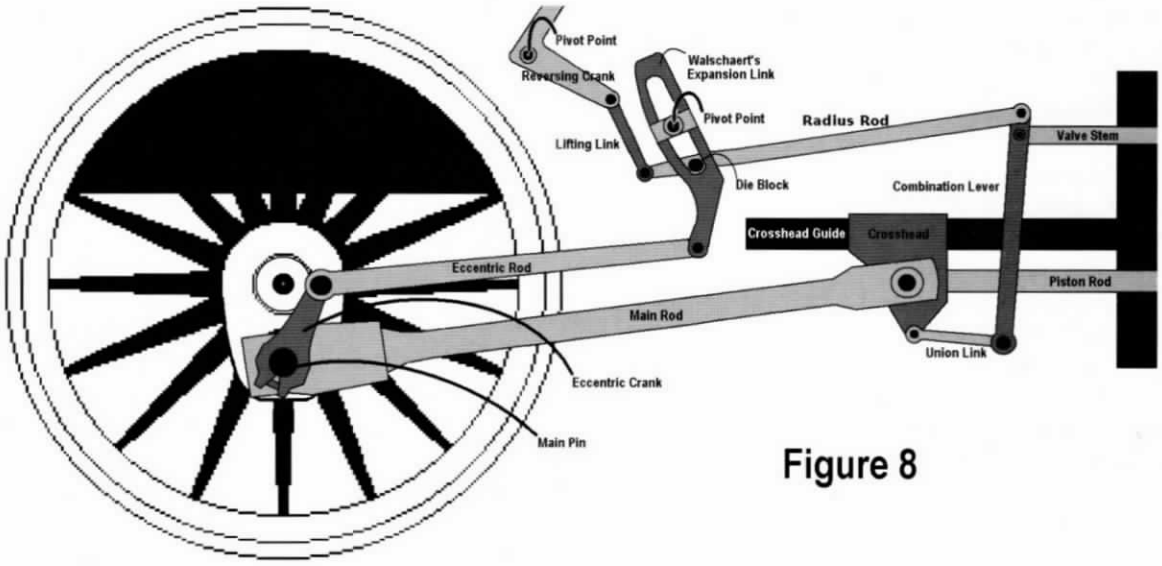

Figure 8

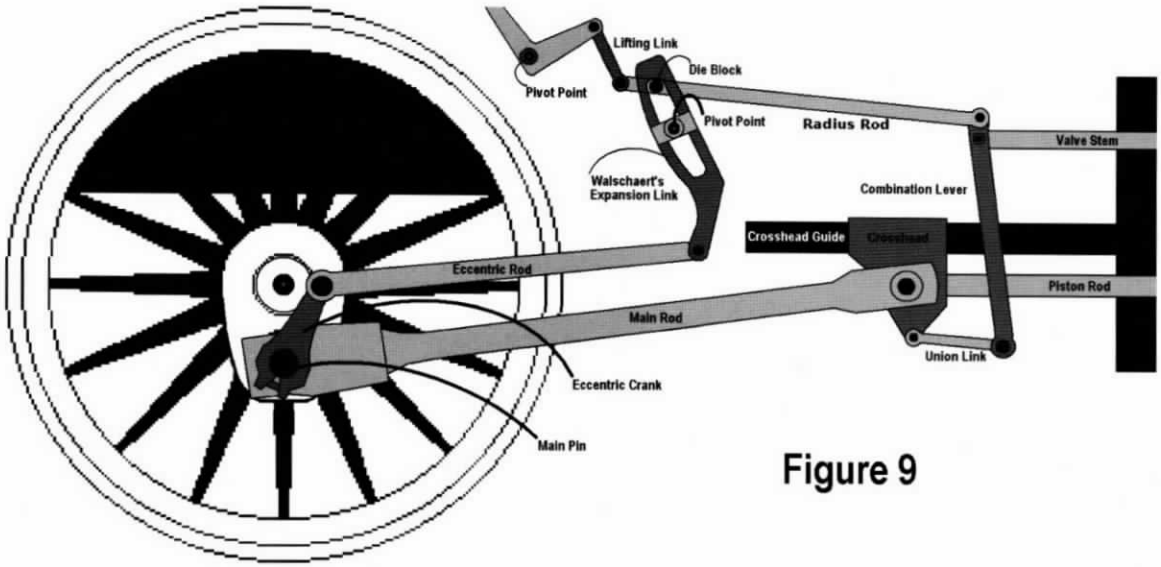

Figure 9

engines were designed this way!

We now have another method of determining what kind of valve the engine has if it is a Walschaert's valve gear.

If the Valve Stem connects to the end of the Combination Lever then the valve is an Outside Admission and that means it is probably a "D" valve. If the Radius Rod connects to the end then it is Inside Admission and that implies a Piston valve.

POP QUIZ: The drawings in Figures 6 through 9 do not show the actual valve configuration. Can you determine whether they are "D" or Piston?

What if you want to model a particular steam locomotive that has Walscheart's valve gear and a piston type valve, yet you want to use a "D" valve to save manufacturing expenses? You can disguise the square steam chest by covering it with some decoration that makes it look like a cylinder, but the valve gear will give away the real innards of the valve.

Most people will not know the difference between Inside admission and Outside admission, or a "D" valve and a Piston valve. Well, for that matter, most people won't know the difference between Walschaert's valve gear and Wal*Mart sports gear. But, if you are concerned with the visual aspect and want it to "look" right, there is a trick that can be done. That trick is called, "Cross porting". This technique causes the front steam port to connect with the rear of the power cylinder and the rear port to connect to the front of the power cylinder. This is usually accomplished by inserting a plate between the valve chest and the power cylinder that has channels in it that connect the steam chest ports to the opposite ends of the power cylinder. This way, when the rear steam port is open to steam, the steam is directed to the front of the cylinder, and vice versa.

Next time we'll discuss Setting the valve gear.

SIDEBAR...

1. George Stephenson did not invent Stephenson's valve gear, as might be supposed. Neither did his son, Robert. Wm. T. James of New York invented it. Mr. James did not find the gear "of commercial value" and passed his idea on to a Mr. Long, one of the founders of the Norris Locomotive Works in Philadelphia, who applied it to their early locomotives. In England, a Mr. William Howe, of New Castle, sketched the valve gear for his employer, Messrs Robert Stephenson & Co. Mr. Howe also did not recognize its value and did not seek a patent. Stephenson did see the commercial value, and paid Mr. Howe twenty guineas and took out a patent for the idea in his own name.

2. Egide Walschaerts, (1820-1901) was Foreman of the motive department of the Belgian State Railways when he invented a valve gear that now bears his name. A Belgian patent was issued on November 30, 1844 to his friend, Mr. Fisher, because at the time the rules of the Railway said that all "products" of a "Mechanic" or "Foreman" belonged to the employer and Walschaerts wanted it for himself. To Mr. Fisher's credit, he never claimed credit for the invention. Because the rules did not apply to patents issued in foreign countries, Walschaerts was able to patent it himself in France. Railways in the U.S. did not adopt it widely until after 1900.

By the way, the possessive apostrophe in Walschaert's can go either before or after the ending "s" because the inventor's name was Egide Walschaerts, but when he patented his design for steam engine valve gear the ending "s" was left off his name. Thus, you can spell it either way and in some manner be correct. It is Walschaerts' design, but Walschaert's patent.

But what about that error in Figure 1 in the first article? Well, it is not significant to what we are doing here just yet, so you will just have to wait until the next issue.

However, I will give you the answers to the present Pop Quiz...

The Walschaerts' gear can be determined from the chart above. The Eccentric Crank lags behind the Main Drive Pin and the Valve Stem connects between the other two connections of the Combination Lever so from the chart, it is Inside Admission and that implies a Piston Valve.

Ignore the chart for the Stephenson's Gear and just figure it out as follows... The wheel is rotating clockwise and the piston is just starting the forward stroke. The Forward Eccentric Rod is moving toward the cylinder, which is pushing the Shifting Link in the same direction. This is then pushing the lower end of the Rocker Arm forward also. The Rocker Arm is pivoting counterclockwise and thus pulling the Valve Stem toward the wheel. The Valve must be just starting to uncover the rear port in the valve chest, which means the steam must be coming from inside the valve, thus it is inside admission, which also implies a Piston Valve.

Semper Vaporo

60th Anniversary for Pennsylvania Live Steamers

PLS will be celebrating its 60th anniversary over the Labor Day Weekend, beginning on ***Thursday, August 31st and running through Sunday, September 3rd, 2006.*** Early arrivals on Wednesday, August 30th are welcome; however, there will be no food service.

We invite all live steamers and their families to come and celebrate with us. We will not be open to the general public. In addition to Large scale ride on trains, we have a **permanent double track loop Gauge 1 track, and a portable Gauge 1 & Gauge 0 track.**

Pennsylvania Live Steamers reserves the right to test, inspect or refuse any equipment that does not meet the basic safety requirements.

Live Steam related vendor attendance is anticipated.

Registration: $5.00 per person for the entire weekend. Spouse and children under 16 free. Each registrant will receive a commemorative 60th anniversary pin, name tag, and information packet upon arrival.

Early registration is STRONGLY RECOMMENDED so that meals, parking and camping can be anticipated. ***THE DEADLINE FOR REGISTRATION IS AUGUST 11TH, 2006 .***

For more information, **registration forms**, PLS safety rules and hotels nearby, check our website at:
http://www.palivesteamers.org/Anniv.htm

Send registration forms to: Lee Nonnemacher, 60th Anniversary Secretary,
C/O Pennsylvania Live Steamers, Box 26202 Collegeville, PA 19426-0202
Phone: 610-275-6070
or
contact Patrick J. Murphy, 60th Anniversary Chairman at 610-454-0477
or
Contact Harry Quirk at 610-346-8073 or e-mail harryquirk@netzero.net

Boilers with a gross internal volume of 50 cubic inches or less and with an operating pressure of 60 psig or less are exempt from the PLS Boiler Inspection Standards.

Aster NKP Berkshire - kit version Conclusion

by Ryan and Charles Bednarik
some photos courtesy Aster Hobby

Q&A, Recommendations, Conclusions, Specifications

Operation manual overview

The operation instructions are very in-depth. Overall, the instructions help to orientate someone to the basic layout of the engine's key components and control levers.

Starting on page 4, entitled: 3. Functional Description; the purpose was to acquaint the owner with an orientation to operating components. The layout of this overview becomes confusing on page 5 with the introduction about the need of a fan to draft between (B) Regulator and (C) Check valves. This could confuse the reader, and a better description of draft procedures can be found in the Trouble Shooting section at the bottom of page 13.

Secondly, I would have developed this topic outline starting with a subtitle: Engine Cabin, using picture A and completing all components in the cabin prior to any reference to picture B.

Thirdly, picture B is not well utilized, and when it is used the numbered parts are not referenced in the description: for example, (E) By-Pass Valve: see picture B does not indicate that it is numbered 1 in photo B.

A better layout for organizing the engine cabin information in photo A could have been accomplished by simply eliminating the usage of letters:

(1)- Water gauge: A water sight glass on the left-hand side.....

(10)- Whistle lever (which should have a piece of tubing on it to prevent burnt fingers).

One aspect of the engine cabin not mentioned (though it is referenced in the operating procedures on page 10) was the firebox door.

Follow with a section regarding Photo B and finally all other important functional components (e.g. safeties, lubricator tank).

The text of each area covered is well done, allowing for easy reference to the items and their relevance to the engine's function.

The topic on starting on page 8: "4. Preparations for operation," serves as a guide to the preparation necessary to fire the locomotive. My personal preference for listing the firing procedures would have been in this order: [A] Safety Precautions,[B] Special Equipment and [C] Tools, [D] Water, [E] Oil, [F]Fuel.

The next section starting on page 10: "5. Operating Procedures." The section on operating covered the necessary information that will result in a step process for firing the locomotive. The only difference is that I always lubricate an engine's running gear at the end of a given run. In building the engine, lubrication was to be done as one proceeded. Perhaps the ready to run Berkshire is not lubricated properly from the factory? I mention this only in reference to operating procedures of water, lube then fuel as standard steps in firing an engine.

The instructional manual offers a section; "6. Trouble Shooting." The topic starts with an interesting introduction to this section that indicates what to expect in the way of performance. A very good comprehensive section on trouble shooting, which could have included other common factors affecting the efficiency of a steam run:

- Wick height and alignment of the burner holder
- Blow by from improper piston ring alignment
- Super heater tube banjo nut loose

The final pages of the instructional manual has a full listing of all the parts for the engine.

Our perspective of building this kit comes from the experience of rebuilding quite a few Aster engines along with a few Ruby kit bashes. So, getting perspectives of those experienced Aster Kit builders should offer some comparison to this kit and its outcome.

Jeff Runge

I would have to say the fit and finish on the parts was better than on the Mikado. The detail work was easier than expected. Overall I was very pleased with this engine. (Unlike the Mikado where there were several improvements you could do, and several correction and additions to the assembly notes.) Other than the ones already published by Aster I don't think there will be many changes to do on this engine.

Sam Dimaggio

My first and obvious comparison is the difference in format of the assembly manual. I really like this format (diagrams/parts/instructions) integrated in one manual rather than the separate manual formats of prior Aster kits.

Secondly, although I haven't finished the kit yet, I'd say the fit and finish of this kit is among the best I've seen. I've had to do very little filing so far, very little swearing, and had almost no puzzling about 'what did I just read?' Or 'they want me to do what?' An obvious reference to the sometimes less than wonderful translations from Japanese to English, whichcan result in confusion.

Lastly, this kit, with the exception of maybe the SNCF 232 U1, seems to represent the pinnacle of their effort. Many times it seemed that they did some things well and others not so well... This time it looks like they brought it all together--great alcohol boiler design, great attention to detail (again, I think only the U1 compares in the ones I've done), and all the functional niceties as well (blow down, etc).

I think this engine, at least in comparison to some of the ones I've built or rebuilt, is one of their finest efforts.

In closing, I would like to again mention the ease of building this kit; as easy as a Ruby kit, despite the complex nature of the engine. I stress this for two reasons: 1) it represents the true nature of the kit process, a very in depth and clear construction process and 2) this kit was built by me-age 16; my first Aster kit-what a wonderful experience kit #001 was!

Having presented it along with a slightly flawed initial run on the club layout, a second run was in order. The second run of the Berk was much better. It seemed to be at peak performance (though we only had 20 cars available for the run, too cold to unload other boxes) with all aspects functional as to the demand of the engineer, Ryan. After the run, there was still the white residue on the stack. Upon opening of the smokebox door we found the cause of the poor initial performance and residue. One of the insulation strips had come loose, causing it to block air flow. At some point it collapsed, clearing the flue(s) and allowing good air flow. At the same time it was affected by the exhaust heat and deteriorated somewhat, allowing particles to flow out with the exhaust. Mystery solved, piece removed and all runs well.

Post run report: we found that the wicks were improperly set too high. I re-adjusted the wicks and steam was up in 5 minutes on a roller test.

I have been asked a few questions about building this kit and will answer them here:

Q: How long did it take you to complete the kit?
A: About 40 hours

Q: Would you recommend it for the first time kit builder?
A: The Berkshire is not for the novice just venturing into the world of Aster kit building. If you have a good working knowledge and know how Aster locomotives are assembled, than by all means, GO FOR IT! The Berk is a fun and intriguing task and the rewards when you see your completed machine pulling that fast freight lap after lap are the epitome of joy. If you are just starting out in the hobby, get a simple, learner kit like the Lion or the Ruby, then graduate (yes, we're back in school) to building a kit like the Mikado or the Berkshire.

Q: How does this kit compare to other Aster Kits?
A: In speaking to Tom Rowe, his base of comparison was the Aster GS4 kit he built. The Berkshire's fit and finish of all parts big and small made the kit quite problem free. This, along with the running gear air test, were indicators of a well conceived plan. The initial air and steam tests seem to indicate that past problems such as binding did not occur with this kit. Most of the glitches encountered in completing this kit were described in the overview of the various processes of building the kit. One indicator of how well this kit was designed is reflected in another statement to me prior to its arrival. Bob Moser had indicated that a kit of this magnitude would take between 60 and 100 hours to build. The time spent was about 40 hours for me to finish, having never attempted an Aster kit prior to this one.

Q: What makes this kit unique among the other Aster offerings?
A: The choice of another Lima Superpower steam engine indicates the essence of steam Aster sought to include in a long tradition of the fine models available. The fact that it was the last steam engine off the Lima production line makes it an important historical statement for gauge one live steam. As for the actual working live steam gauge one model, there are numerous upgrades to operating a live steam engine unique to the Berkshire: the realistic and fully functional reverser, the best functional drain cock and a boiler specifically designed for this engine. The attention to detail is tops on the list (e.g. opening journal boxes on the trucks) which demands that one stop and take a long, long look at all it has to offer visually.

Q: If I had the opportunity to improve this kit, what would I recommend?
A: The major upgrade to the kit would have been for the suspension to be fully equalized and sprung per each wheel. As the model is now, a few items such as more detailing around the firebox is recommended. Most other customized things would be unique to each individual working with this fine gauge one scale model.

Q: Is this locomotive easily kit-bashed?
A: This locomotive has a wide rrange of prototypes to choose from for turning it into your Berkshire of choice, whether it is a Virginian C&O copy, a NKP counterpart, a Pere Marquette brother, a B&M undertaker (named for it's coffin feed-water-heater), or for a classy passenger hauler, a RF&P Berkshire. These could be conceived by a little imagination (Polar Express) and, by paying attention to detail, will result in a unique engine, no matter what version you choose.

NICKEL PLATE ROAD 779 BERKSHIRE - TYPE S3

SPECIFICATIONS:

Scale/Gauge: 1/32, 45 mm (Gauge One)
Weight: 11.5 kg (Engine 7.5 kg + Tender 4.0 kg), (25.35 lbs.)
Length: o.b. 1000 mm, (39.5 inches)
Height: 153 mm. (6. inches)
Width: 110 mm (4.25 inches)
Wheel Arrangement: 2-8-4 - Berkshire type
Driving Wheels: 53.0 mm dia. (2.08 inches)
Leading Wheels: 27.0 mm dia
Trailing Pony: 27.0 mm (front) 34mm (rear) dia.
Tender Wheel Arrangement: 2 x 3 axle trucks (Buckeye Trucks) - 27 mm disc wheels
Cylinders: 2 cylinders, with slide valves
Bore: 15 mm x Stroke 24 mm - Working drain cocks
Valve gear: Baker Valve Gear
Reverser: Lever
Boiler Type: Simplified Locomotive Boiler (with dry firebox sides) and three flue tubes
Pressure: 3 / 4 kg/cm2
Water capacity: 450 cc (at 80% full)

Fittings: 2 x Safety valves, Gauge Glass, Throttle, Blower Valve. Blow down Valve, Pressure Gauge, Bypass Valve, Superheater, and Whistle.
Feed Water Pump: Axle Driven Pump (bore 5 mm x ram stroke 6 mm.)
Lubricator: Roscoe displacement type
Tender: Hand operated pump
Fuel Tank 500cc at 80% full of Methylated Spirit, Removable
Water Capacity: 700 cc (80% full)
Minimum Radius: 3.0 meters (10 feet)

Aster Hobby Co. Inc. of Yokohama Japan has compiled this list of errors, missing instructions or incorrectly explained instructions in the assembly manual for the NKP Berkshire locomotive. Some of the missing instructions may have been noticed and corrected by the more experienced kit builders and therefore are of no significance. Please check this listing and take corrective action to assure trouble free operation of your Berkshire locomotive.

Section 11 Boiler
Apply packing compound to thread of cap #129.

Section 21 Tender, page two
Apply packing compound to threads of cap R19 and R20. Apply packing compound to bottom surface of water pump body #R41.

Section 4 Axle Driven Pump
Banjo fittings D7 and D8 are different and must be installed as specified for the hand water pump to work properly. (note slot in the end of D7).

Section 5 Drain Cock And Reverser Devices
Leaf springs E7, E8,and E9 are mistakenly labeled with the letter F instead of E in the instruction text block.

Section F Cylinder
On page four, the cylinder cover and gasket are incorrectly labeled as E39 and E40 in the instruction text box.
Section 11 Boiler
Page four shows banjo bolt I40 and I41. Make sure you install them as shown since the hole diameter is different on each part. Banjo bolt I40 is also identified with a boss on the hex head surface. Wrong installation can affect locomotive performance.

Section 13 Boiler casing and fittings
Page two shows a M2x14 countersunk screw to attach steam dome J20 to the boiler shell casing. A M2 nut has to be used on the inside of the boiler casing to secure the steam done in place.

Section 19 Buckeye Truck
The washers P20 next to the assembled truck will not be needed until truck installation takes place in section 22.

If you have questions regarding your NKP Berkshire assembly, please e-mail at:
asterhobbyusa@teleplex.net

A New Benchtop Mill

by Charles B. Lynn

Getting it out of the crate and into the workshop...

I recently purchased, from my local Harbor Freight outlet, a 12-speed bench-top vertical drill/mill machine. It is manufactured by Central Machinery of China. You may look it up at www.harborfreight.com by its model number, 42976. The paperwork with the mill states that its net weight is 470 pounds. A stencil on the outside of the wooden packing case indicated a metric weight that translates to about a hundred pounds less. Perhaps this was a way to obtain a cheaper cost from the shippers. Following is a description of my experiences getting this machine home, getting it down to my basement and getting it up onto my work bench.

Harbor Freight #42976 Mill/Drill

At the store they used a fork lift to load the case into the back of a friend's pickup truck. At my house I secured one end of a magnesium alloy extension ladder to the end of the pickup truck bed and laid the other end of the ladder onto the floor of my garage. My ladder is an eighteen footer, so collapsed it was about nine feet long and was sturdy enough to serve as my ramp. In the bed of the pickup truck my friend and a neighbor helped me turn the packing case on its side and slide it down the ladder. Then I was on my own.

I securely screwed a four-wheel dolly onto the bottom of the case. Then I screwed a long board to one side of the case. At the bottom the board was even with the bottom edge of the case. At the top the board stood up above the top of the case by about three feet. The board gave me the leverage I needed to manage the case. By grasping the end of the board I could easily tip the case upright, roll it around, and lay it on any of its sides.

The access to my basement is a straight shot from the garage through a door into the kitchen, across about four feet of kitchen flooring and then through a door and down the basement stairs. I laid the ladder from the top of the stairs out onto the garage floor. I loaded the case onto the ladder a few feet in from its end. I made sure the board I had screwed onto the case lay between the rails of the ladder to serve as a guide. The end of the case with the dolly on it was toward the basement. I lay some wooden dowels on the kitchen flooring and lifted the garage end of the ladder until it made contact with the dowels. Then it was easy to roll the ladder toward the basement with the case on it. I ran a come-along from the garage end of the ladder to my car to prevent the ladder and the case from proceeding down the basement stairs before I was ready.

When the case on the end of the ladder had reached the top of the basement stairs I switched the come-along from the ladder to the case itself with a little bit of slack. I then took the end of the ladder that was projecting out over the stairs and pulled it forward on the rollers and at the same time forced it down until the weight of the case held it down on the stairs. Then I used the come-along to ease the case down the ladder. When the case reached the bottom

of the stairs I used the board screwed to the side of the case to lift the case upright onto its dolly and roll it into my workroom.

I did all of this with a careful eye to not damaging woodwork, kitchen flooring, basement carpeting, etc. I still chose to do it when my wife was away.

The floor of my house above the basement is held up in part by an I-beam that runs the length of the basement down the middle. The I-beam conveniently runs above the front edge of my workbench. I used it to hang lifting apparatus to lift the machine (after uncrating) onto my bench. However, I did not want to attempt lifting the entire weight of the machine at one time so I disassembled it.

First, I took off the motor. There is a power cord running from the motor to an on/off switch located on the head of the mill. To remove the motor I cut this cord and spliced in a male and a female plug so that I could easily reconnect it. Then I unbolted and removed the motor.

Next I tried to remove the head of the mill with the column attached. As I was trying to lift the head and the column out of the base I realized that the head was coming off the column, which was about as good for my purposes. However, this brings up a couple of thoughts. Had I realized the head was so easy to remove from the column I would have opened the packing case in the garage, removed the motor and the head, resealed the packing case and then moved the case to the basement. That much less weight would have made it easier.

The paperwork with the machine warns that a bench mill is top heavy. If proper precautions are not taken the mill can tilt while being lifted with drastic results. The head is held onto the column solely by gravity. Trying to lift the entire machine by tying a rope onto the head could cause a disaster. Yes, the head does come off the column, but only grudgingly. If lifted by its head the machine could be a few feet above the floor before the head came loose. Ouch!

The machine was covered with thick something-or-other (do they still use cosmolene?) to prevent rusting while being shipped by sea from China and I chose to remove that before reassembling the mill. I called the store to find out how they cleaned up the machines they display on their sales floor and they told me to use paper towels and elbow grease. Other methods are suggested on the Internet, such as WD-40™, hair dryers and Goof-Off™. Without the weight of the motor and head I could move the base of the mill around on my workbench to access all surfaces. By grasping the column I was able to tilt the base onto its side. This enabled me to check for metal shavings left over from the manufacturer of the machine that might have found their way onto the lead screws and the rack on the column.

I used the come-along to lift the base of the mill with its column onto my work bench. Then I used a rope with two double-sheave pulleys to hoist the head up onto the column. I couldn't use the come-along for this as the length of the ratchet assembly prevented the come-along from hoisting the head high enough to be above the top of the column. I really appreciated the mechanical advantage I got from the two double-sheaved pulleys.

Safety first! Never position yourself below a heavy object you are moving. I did not stand on the stairs below the case as I eased it down the ladder. I stood above it in the garage and worked the come-along. Never position your feet under or even near an object you are hoisting. I stood to the side and worked the come-along or pulled on the rope.

Specifications:

Motor: 1/2 hp,120V, 8.5 amps, 1700 RPM

12 speeds: 300, 400, 540, 720, 900, 1040, 1500, 1740, 2100, 2260, 3100 and 3840 RPM

Head rotates 360°

Spindle taper: MT-2

Spindle stroke: 3-3/8"

Spindle diameter: 1.265"

Drill capacity: 5/8"

Face mill capacity: 1-1/2"

Chuck to table: 10"

Table size:16-1/2" X 6-1/16"

Column diameter: 2.830"

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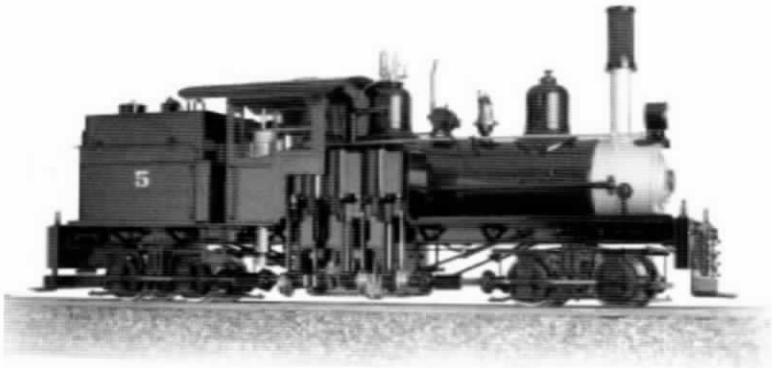

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Prizes will be awarded!

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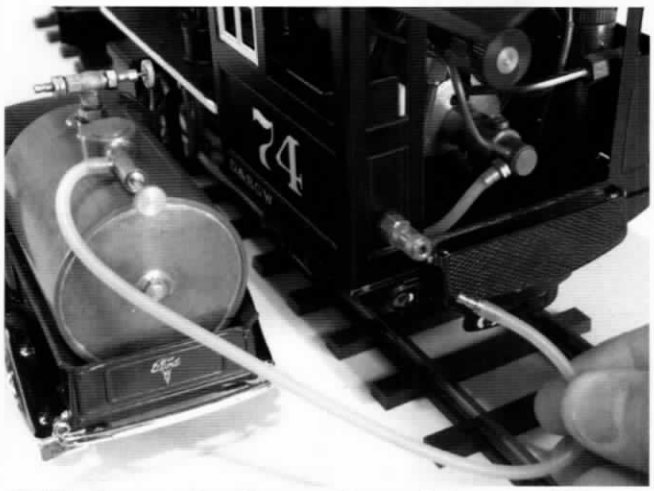

Quick Connect Couplings can be used for many different connections. In this photo an auxiliary fuel truck is easily connected to an engine for raising steam, then quickly disconnected when it is time to leave the station.

Contact: **John Synnestvedt**
5172 Lake Shores Road
Virginia Beach, VA 23455
757-363-0958
synnestvedtjd@hotmail.com

SWAP SHOP

For Sale: Two older (early 1990's ?) Jeff Saxton 1:20 scale Westside Lumber Company Kits. One kit is for a 24' Deckless Log Flatcar and the other kit is for a 22' Russel Skeleton Logcar. I didn't buy these kits new but got them as part of a model trade. After looking at everything, it looks like both kits are complete. These kits include the trucks, but need wheel sets. $50.00 for both kits including postage within the US. Over seas buyer pay shipping at cost. ALSO...Eight axles of spoked LGB metal replacement wheels - Part # 67319. Six of the eight have never been taken out of their packages (two axles per package), the other two have been unwrapped, but never actually used. $36.00 includes shipping within the US. Overseas buyer pay shipping at cost. Payment accepted via PayPal, money order, or cashiers check. Will ship upon receipt of payment. E-mail with questions - scottandnancy@charter.net (86)

For Sale: LGB Frank S. Good runner, good condition. $700 plus shipping lower 48 states only. Contact Steamnteach@aol.com for more info or pics. (88)

Wanted: Looking for Aster Reno 4-4-0 American Type. Please contact jpc@cogeco.ca (88)

For Sale: Aristocraft Live Steam Mikado. Brand new, never fired. Undecorated version. The carrying case was damaged by UPS, thus the lower than usual selling price. The case is fully functional with the exception that the wheels can no longer be attached. Also, case has some dents. $1175 plus shipping. Royce Brademan 703-799-9643 evenings. (88)

For Sale: Accucraft 3 cylinder Shay with a Bob Weltyk whistle installed by him. It has only been fired to test the whistle and other than that, just sitting on a display track. No other modifications. Included are the original box along with a carrier. ***Price reduced!*** $1700 plus shipping/insurance. I can take payments through PayPal including credit cards. Need some pictures/information or my phone number? Just e-mail: darrylnoble@comcast.net (88)

Swap Shop listings are offered at no charge as space permits. No dealers and no phone-in ads, please! Send your listings to SitG, PO Box 335, Newark Valley NY 13811 ● fax to 253-323-2125 ● e-mail to <rbrown54@stny.rr.com>. Ads must contain sellers name, plus address and/or phone number. Ads will be run one time only unless previous arrangements are made.

END OF THE LINE

Smoke and mirrors...

Just the other day I was looking at photos sent in by readers and marveling at the level of skill and fine craftsmanship displayed by so many people. It took me back to my early days in the hobby, when most of us would have been horrified to think of altering a live steam loco in any way. Now it's not uncommon to find changes in paint schemes, detailing, weathering and even locos being attacked with (gasp!) saws, drills and other serious devices for metal cutting, bending and altering in every possible way.

John Shawe and Torry Krutzke routinely strip down a loco and fit it with a new, coal burning boiler. Charlie Mynhier and Norm Saley carve complete working steam locos out of pieces of brass, stainless steel, and even titanium.

There are many others....too many to mention here...who are scratchbuilding, kitbashing and altering their steamers to make something they can be rightfully proud of.

What happened? This revolution is due, at least in part, to the availability of relatively inexpensive commercial locos and parts. While we would never have even considered such serious alterations on a $5,000 locomotive, carving up a $300 locomotive wasn't nearly so intimidating.

A considerable number of our fellow steamers have acquired small, affordable lathes and milling machines... and learned how to use them.

The success of all this inspires and gives courage to those of us who might otherwise settle for being armchair hobbyists...longing to create things we can call our own, but not willing to take the risk.

So...three cheers for those pioneers who jump in, make the chips fly and make this hobby more interesting and more fun with every passing day. I hope you will all share your efforts, successes, and even your failures with your fellow steamers here in these pages.

Happy steaming!

Ron

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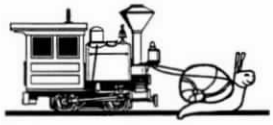

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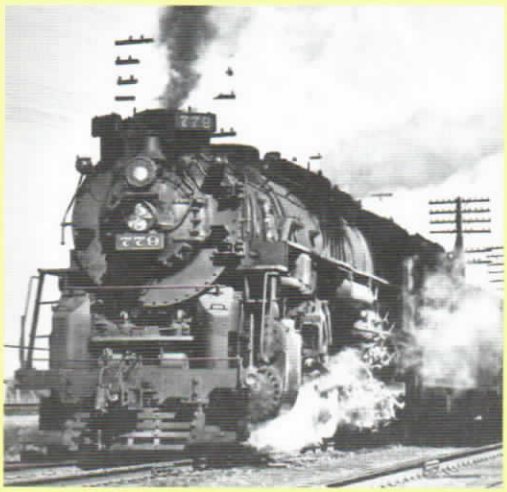
The stunning Nickel Plate Berkshire # 779 is still available in kit or factory assembled version.
Pictured below, the real NKP #779 in the 1950's, and the Aster NKP #779, keeping the legend alive.
Pictures courtesy Allen County Historical Society, R. Schlabach, Aster Hobby Co. Inc.



Delivery of the "Bulleid Light Pacific" in Southern Railways "Spitfire" and British Railways "Winston Churchill" livery is now in progress.

In 1975 Aster Hobby Co. Inc. introduced its first gauge one live steam locomotive, the Southern Railways "Schools" type 4-4-0 which since has become a collector's classic.
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