$3.75

Steam in the Garden

Magazine

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

Volume Two Number Five

February/March 1992

INSIDE.....

Wrightscale PORTER Review

Tips & Hints on Engine Building From a Commercial Loco Builder

News, Opinion and Commentary on the Live Steam Scene

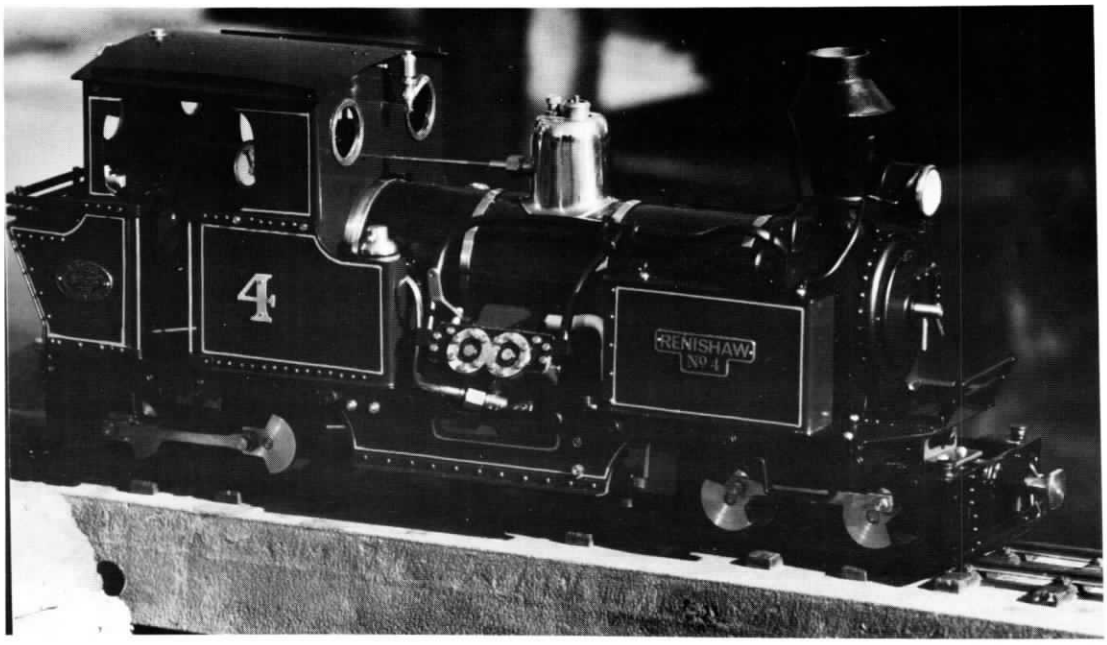
And Lots More.....

Top Photo: Mike Gaskin-built Wiscasset coal fired 2-6-2, now lettered and detailed for Dave Pinniger's Burnham and Berkshire Railroad, on a running-in turn. Read more about this loco in the letters column in this issue.

Photo by David Pinniger

Bottom Photo: Renishaw No. 4, a scratchbuilt V4 Heisler by Peter Angus. The V4 powerplant is a Caton marine engine by Maxwell Hemmens. In typical Heisler fashion, the geared trucks are driven through a driveshaft and universal joints. This project took Peter 9 months to build, and it's obvious that it was time well spent. My guess is that it has power to spare.

Photo by Peter Angus



ON THE COVER:

Archangel **"Sgt. Murphy"** seen passing the old abandoned lead mine on John & Pauline Wenlock's Clwyd & Dee Railway in Wales, Tenmille Lynton & Barnstaple van and 4-wheel wagons in tow.

The Archangel "Sgt. Murphy" was a development of the "Brick" and "Princess". A large, single cylinder and slip eccentric valve gear, meths fired pot boiler. A basic design from the mid to late '70's. Note that the owner (not recorded, alas) has modified the dome to more closely resemble the prototype. This was an ex-War Dept. Kerr Stuart 0-6-0 which was purchased second hand by the Penrhyn Quarry Railway in North Wales. The "Sgt." was rebuilt in the quarry workshops with a lowered boiler and is preserved at the Bettws-y-Coed Railway Museum in North Wales.

Photo by David Allan

What Price Quality?

We hope you all enjoyed the beautiful photos on the cover of issue #9 (Jim Overland's Eidskogen Lumber Co. #1), on the cover and inside front cover of issue #10 (Maxwell Hemmens Porter and Mike Dockery's Garratt), and throughout this issue you hold in your hands. You probably noticed that they looked a lot sharper and clearer than previous cover photos and most of the photos inside all issues prior to this one. The difference isn't in the photographer or the camera, but rather in the process used to reproduce the photos in the magazine.

When SitG began life as a rather stark newsletter nearly two years ago, there no photos at all, as all of our attempts to add them with a copy machine ended in dismal failure. But our readers kept asking for photos, so one year ago we invested in a scanner. We thought the scanned images looked pretty good and they were inexpensive enough to allow us to include several in each issue, so we were satisfied with the process. Our more critical readers asked why we weren't using half-tones (some even went so far as to demand color and monthly publication, but we immediately assigned them to the "lunatic fringe" category!), so we made numerous inquiries and determined that it would be too expensive to use half-tones without raising subscription rates - which we were trying to avoid.

Finally we caved in and used a half-tone on the cover of issue #9 (as noted above) and the results were better than we had expected. It's no contest - when comparing half-tones to scanned images, half-tones win every time. So in issue #10 we added more of them, and lots of phone calls and letters from readers after those two issues hit their mailbox told us we were on the right track, as they loudly proclaimed that they wanted all the photos in each issue to be half-toned rather than scanned.

Okay, we like the half-tones too! They're crisper, sharper and offer a much better look at details, as well as just being more pleasing to the eye. But half-tones are expensive, and they run up the cost of printing each issue by a whole bunch.

Another thing that our readers constantly ask for is more pages, more articles, more everything. We've added more pages with every issue but one since since issue #1, but more pages also cost more money - at the printer and at the post office!

So we've taken a poll of readers that have had a chance to compare, asking them first how they liked the half-tones. It was unanimous - everyone queried thought they looked great. Next we asked if we should replace all the scanned images in each issue with half-tones. Again the response was unanimous - YES! DO IT! The third and last question was the sleeper - do you want high quality photos, more articles and more features enough to pay for them? To the tune of an extra six bucks per year? The answer was still a resounding and unanimous YES.

This magazine is for all of us and we want it to reflect everyone's interests and preferences, not just our own. That's why we took the time to ask as many of you as possible how you feel about paying another $1 per issue to get more articles, more features and high quality photos throughout the magazine. Based on what we've heard from our readers, we believe that's what all (or nearly all) of you want, so that's what we'll try to deliver, starting with this issue.

Drop us a note or postcard and let us know what you think. Thanks, we appreciate your support!

Happy Steaming!

Ron

Steam in the Garden Magazine

Volume Two No. 5
Issue #11

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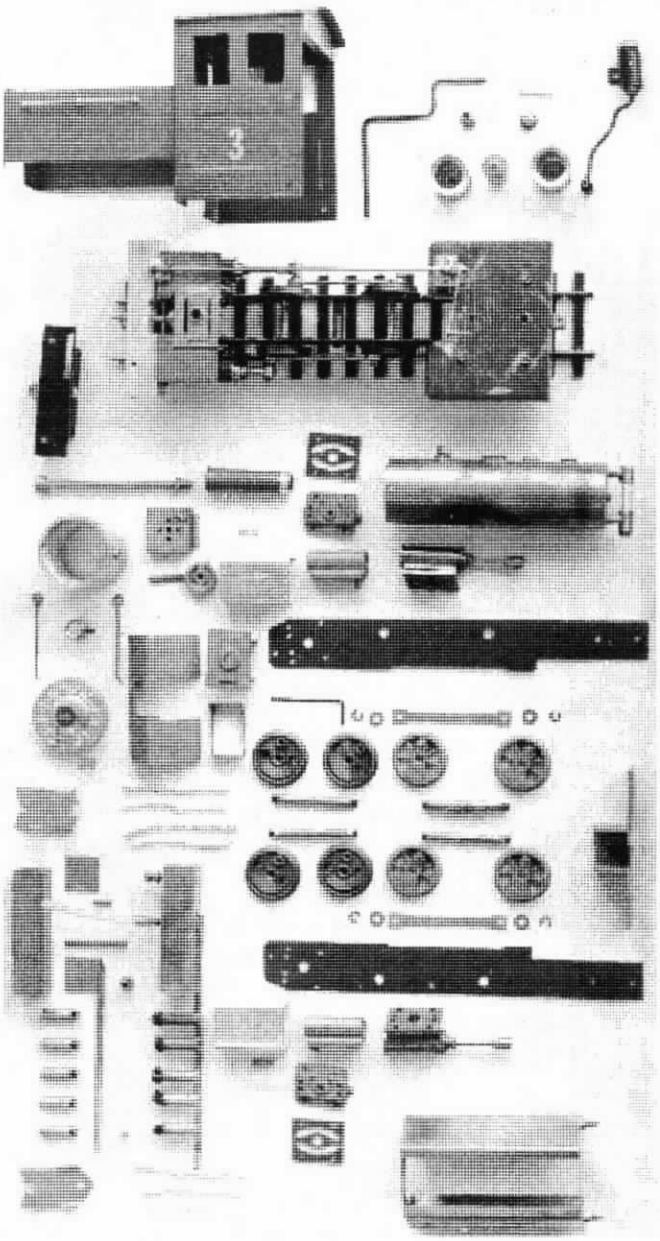
What's New?

Maxwell Hemmens North America, 22 Stratford Avenue, Greenlawn, New York 11740, is a new company representing Maxwell Hemmens Precision Steam Models of England in the U.S.A. Owner Peter Martin tells us to look for great things for the American small-scale live steam enthusiast from Maxwell Hemmens. An item of great interest is the announcement that he will stock spare parts and will offer warranty and repair service for all Maxwell Hemmens products. Peter also mentions that they are in the process of getting a toll-free 800 number. All this makes Hemmens engines even more appealing to the US purchaser, especially for those that are concerned about the time and expense involved in sending a steam engine overseas for repair. The Maxwell Hemmens catalogue (a thing of beauty in itself) illustrates several steam locomotives, as well as traction engines, stationary engines, marine engines and fire engines. Of particular interest to garden railway enthusiasts are the gauge 1 Porter and the adjustable gauge (gauge 1 or gauge 0) OGWEN, a model of an 0-4-0 industrial or quarry engine built by the Avonside Engine Co. in England. We reviewed the Porter in the December/January issue of SitG (#10) and will soon be bringing you an in-depth review of OGWEN.

Reliable sources have told us that Merlin Locomotive Works, which has been having quality control problems and financial problems for quite some time, has finally succumbed to hard times. The good news is that Roger Hine, of Friog Models, is reported to have taken over Merlin. Our sources indicate that Roger plans to relocate the factory and expects to continue producing some of the models from the Merlin line - and some new ones of his own design as well. We have heard only high praise about Roger and we wish him well in getting Merlin back on track and producing high quality miniature steam locomotives. We will continue to pass on information to our readers as we receive it - including an address for the new Merlin and names, addresses and phone numbers of any dealers that will carry the Merlin line.

Decker's Trains, Rt. 1, Box 102-E, Hot Springs, South Dakota 57747 - phone 605-745-5487, sent us some samples of their Heywood Point Levers - or switchstands, as they are more commonly known here in the USA. These point levers are modelled after those designed and used by Sir Arthur Heywood on his 15" gauge estate railways in England. Made of heavy lost-wax brass castings and completely assembled and painted, these point levers use a pivoting counterweight to move the actuating lever one way or the other - and keep the points firmly in place. The base has 4 holes for mounting the point lever to your switch ties, and it is suggested that the actuating lever be connected to the turnout throwbar with a 2-56 threaded rod and model aircraft ball joints, a quick and trouble-free method of connecting two moving parts (no alignment problems!). These point levers are 1-1/2" scale, but they look right and operate perfectly in a 1:24, 1:22.5 or 1:19 setting. This is an exceptionally strong and well-built unit that will be durable and trouble-free in any outdoor environment. Send $1.00 for more info about these point levers and all the other nifty items offered by Decker's Trains.

Berkeley Locomotive Works, 2821 Hillegass Avenue No. 22, Berkeley, CA 94705 - phone 510-849-9284, is alive and well. They are still offering their lost-wax white bronze cast 10-spoke drivers, machined or unmachined, for Mamod or for your scratchbuilt project loco. Best news of all from BLW is that their Lonesome Dove loco project, which had been temporarily shelved, is now back on the front burner. Look for it in the summer of '92.



We still have a little work to do.....

but the first batch will be ready any day now!

American Porter-type tank loco, alcohol fired, displacement lubricator, spoked wheels, oscillating cylinders with O-rings, water level gauge, boiler filler valve for unlimited duration runs, highly detailed body, highest quality materials throughout. Precision engineering at an affordable price.

VISA/Mastercard preferred

Send $2.00 for details of this loco and our large range of Mamod accessories.

Salem Steam Models
Brynglas, Salem,
Llandeilo, Dyfed SA19 7HD
Wales, United Kingdom

R P O Mailbag

Letters from all over

Letters from readers are welcomed and encouraged. Offer advice and encouragement, suggestions, constructive criticism, tell us about your current project (and don't forget the photos!), or just share live steam experiences. But please keep it to a reasonable length or I'll be forced to convert it to a full-length article! Send any contributions to this department to: SitG, Dept. RPO, P.O. Box 335, Newark Valley, NY 13811.

Dear Ron,

Comments on items in August/September 1991 SitG.

1) Gauge 0/Gauge 1 track may be had from Gargraves. I had a box made up.

2) 10mm and 3/8" scales are not the same.

3) My Bay 52/6 does not have a tender axle pump on driving axle. No water to Barry's loco running on test stand.

Ed Williams
(No address given)

Dear Ron,

My interest in small scale steam was sparked by the writings of Jack Wheldon in Model Railways magazine in the mid 1970's and early 1980's. Model Railways was available at the local municipal library, so I read Jack's articles but never had my own copy of them, something which I have come to deeply regret over the ensuing years.

The English model railway press during the 70's printed a significant number of articles on small scale live steam, and those magazines have a fairly wide circulation in this country. So whenever I go to a model train show, I always paw over the second hand stalls to see if there are any Model Railway News/Model Railways, Model Railway Constructor, Railway Modeller or Practical Model Railways magazines containing articles on garden and/or small scale steam.

The construction of the Bolton Bahn hasn't made much progress since I've returned home. While Sydney has quite a mild winter, it is still cold enough to discourage any significant outdoor work. Most activity has been focused on fitting Kadee couplers to my G scale rolling stock and Australianising some of the LGB wagons. I've got a LGB club meeting scheduled for my home in November and so have a target to get the railway into shape before then, but there should be plenty of time in Spring to complete the remaining major work to get Phase 1 finished to an operational stage.

And now I have a question for you. (see Dr. Steam in this issue for Bill's question about his LGB Frank S.)

Bill Bolton,
St. Ives, NSW, Australia

Dear Ron,

Issue #10 just arrived; I'm enjoying it immensely. I'm now sorry that I wasn't a charter subscriber to SitG. To remedy the situation as best I can, please find enclosed a check for any available back issues. I wish there were more still in print. I know I'll be driven nuts by references to articles in issues I don't have (but wish I did).

I offer the following on the assumption that you keep tabs on the interests of your readers. I own both a Roundhouse HELENE and a Merlin MAYFLOWER. Keeping them running is part of both the charm of, and the curse of, this hobby. I'm not a machinist; I haven't the mechanical skills or nerve necessary to tackle the projects that require too much disassembly. But it seems that, on a commercially available loco, things like setting valve timing and other basic skills ought to be relatively simple. But the best (only!) advice I've gotten from anyone about trouble-shooting is, "keep tinkering with it until it works again." For me, this is a recipe for disaster. My MAYFLOWER has sat on a shelf for two years. Bill Bradford struggled nobly to make things right. My subsequent efforts to completely foul things up have been wildly successful. As for the folks at Merlin, they're cheery enough on the phone, but my last letter took five months to get a response. I'm loath to return the loco to them for fear I'd never see it again.

The HELENE is a sturdy and reliable beast, but it seems that not even slip-eccentric valve gear is im-

mune to the malevolent gremlins that haunt my enginehouse.

To make this brief, (I know, too late).....I understand that no two locos are the same, which makes generalizing difficult. Nontheless, any articles that help the beginner learn the ways of the master tinkerer would be most appreciated.

Frustrated but yours,

Matthew Labine
Norwalk, Connecticut

Dear Ron,

Help! What should we do? Last week our tracks were covered with snow; this week it's horse manure!

Sorry you weren't able to make it to our Gathering in September - you might have been able to save the day. A couple who was very new to garden railroading stopped by, and were amazed to learn that there is such a thing as a "toy" train that runs on live steam. Chris pulled the Mamod off the siding, fired it up and sent it on its way. As our guests marveled at the sight, the Mamod, rising to the occasion, quietly melted all of the solder out of the boiler. Again.

My Shay came in from Larry Lindsay shortly after that. It's a pleasure and a delight. And as clumsy as I am, I've only managed to set the whole thing on fire once.

The Sunday before Thanksgiving, Chris and I hosted an impromptu steamup that was better in theory than in practice. Chris started the day off right by breaking a motor mount on his hedgehog (a scratch-built monster that is sort of a model airplane on a steel frame, intended to blow leaves off of the track). After the track was cleared (by hand), Jason fired up his Mamod. Unfortunately, it developed a rather dramatic steam leak, and was retired to a siding. Then Vernon fired up his steam dummy (one of Marc Horovitz's), which went up in flames and melted all of the gears. At that point, Bob seemed just as glad that he had left his new Hyde-Out Mountain Shay at home, and Jeni flatly refused to take her Aster Schools out of the box! Through it all, the Shay ran without regard to the smouldering carnage around it.

Soon afterwards, Jim Stapleton's new Roundhouse SR&RL #24 came in, and he brought it over for the inaugural run. I had seen Sam Muncy's at the convention in Cincinnati, but had forgotten what a beautiful engine it is. Jim got it fired and running, but it wasn't happy with the cold and the wind (neither were we, but we had hot tea) or the grades, so Chris fired up the Shay and set the throttle to a crawl. It ever so gently nudged #24 up the grade, then dawdled down the hill after it. Is this an acceptable break-in technique?

A couple of weeks ago, our club had their January meeting here, but it looked more like a Shay convention! Along with mine, there was a Hyde-Out Mountain Shay and another by Precision Scale. What a beautiful sight.

We bought the house less than a year ago, so the railroad is in its infancy. Nevertheless, with about 120 feet of track and one short siding, we had five trains running at once. Jeni and her Aster Schools didn't make it, but even without it steam was in the majority that day. One member asked how we felt about steam oil everywhere.....

At long last, Chris' Wrightscale Porter arrived. Initially, it wouldn't run, but a call to Pete Olson got it moving. I hadn't seen it run before, so was surprised at how well it ran slowly, and at the great steam effects and chuff.

Hope to see you at the convention again this year, if not sooner. Till then, we'll be in our backyard with our trains and our manure.

Keep up the good work!

Chris & Leslie Hall
Ridiculous & Sublima Railway
Hyattsville, Maryland

Dear Ron,

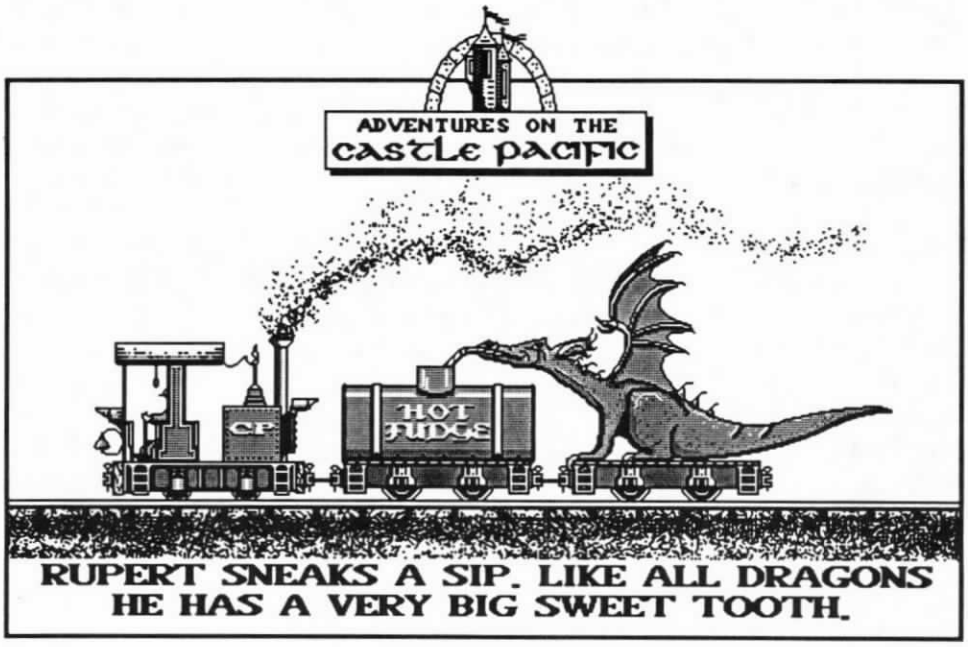
Sorry to be so late renewing, but I wanted to enclose the info sheets on an old "O" scale live steam engine given to me by the late Ken Hydorn, in hopes that you might be able to identify it. The engine is poorly put together and I don't know if one ever ran satisfactorily when completed.

Thanks for a very fun magazine.

Gordon E. Jensen
Seattle, Washington

The info that Gordon enclosed included a copy of a letter from the G. Rosekilly Co. of San Mateo and San Francisco, California, dated 1955. They identified themselves as the importers of the engine in question, "The Famous Maid of All Work", a 2-6-0 Mogul Kit, and gave quite a lot of information about it. It was sold at the Emporium in San Francisco. Factory built price was $99.50 and kit price was $65.00! Unfortunately, the photocopied pictures that Gordon enclosed are too poor to reproduce here. I'm sure that there is someone out there that knows all about this engine - maybe even has one running or on display. Please send us a letter (with photos if possible) and we'll print it and forward it to Gordon. - ed.

Rick Drescher's.....



Gazing Into the Fire

by Peter Jones

Does $$ (or ££) = Pleasure?

This time I offer a few words on how to spend money on steam engines.....and things. I speak as a very small player in this game, but of long standing; someone who has made a few mistakes and seen others do likewise.

A very large chunk of garden railways is the live steam engine. It's what SitG is all about. It is also where most of the bucks go. One mistake can be to spend out on the most expensive engine you can afford. It may not be the best for your needs. If your track wanders uncertainly around a small area, with sharp curves, a simple 0-4-0 tank engine will be a better servant than a mega-Aster. The latter likes broad, sweeping curves, nicely laid. It looks better, apart from anything else.

Best engine doesn't equal best railway. It may look good in photographs and written on a stock list, but it isn't too much use if it won't go around your track reliably. No, when bedgeting, it is better to cut back on the engine ambitions and to invest that bit of extra time and cash on a reliable track. Spending money on cement doesn't feel so good as spending it on an extra engine, but, in the end, it often offers better value.

Think too about just what sort of railway you are building. An internally fired engine calls for more hands-on control; fine if your railway is at high level and accessible. If you have a pond, chances are that engines will stall in the middle of the bridge. Simple pot boilers or gas fired engines tend to be more tolerant of curves and grades. If you line has some severe humps and hollers, radio may be essential to get round.

I'm afraid that we are stuck with the term "chequebook modeller". We are also stuck with the fact that some people think it a derogatory term. I don't. If you can afford to buy in what amounts to time and expertise, then do it. I see no virtue in work just for the sake of it. Many of us don't have that choice - we have to build and save up. There is a reward to be had in creating something with your own hands, but we can still envy somebody who can afford an easier route.

The deep wallet can also have its dangers. It can be all too easy. There is a common scenario where someone newly retired sets up by going on a spending spree a bit too quickly. It is easy and it is enjoyable. There are engines which look good, but which run so fast as to be virtually useless. There are those which tolerate bad track and those which don't. There seems to be a connection between building a railway too fast and spending money likewise. It is often better to buy a simple, reliable engine of known regular performance. Get to know it as you slowly expand your railway. The steam loco is very different from almost any other type of model. It is very idiosyncratic and has almost human variation in characteristics. The garden railway is NOT an indoor railway build outdoors of weatherproof materials (LGB apart.....!). Therein lies the pleasure; a pleasure best acquired slowly, no matter how tempting the delights of spending. Like other pleasures in life, go not for the brief, bright flame, but the long, slow burn.

The Steamchest

by Marc Horovitz

The Engine Driver's Tool Kit

Those of us who dabble in small engines must necessarily tote around tooboxes so we can see to the needs of our wee beasties. Here are some ideas regarding the contents of same.

Certain things must be in attendance to perform the lighting-up ritual. A small adjustable wrench is a handy thing for removing too-tight safety valves, for boiler filling. A safety valve with a rubber gasket need only be tightened finger-tight, but after running it may be too tight (or too hot) to remove with unassisted fingers.

A variety of syringes is a must. A couple of the horse variety will do well for injecting the fluids of life -- water and meths -- into your engine. A smaller one is useful for sucking out and refilling displacement lubricators not equipped with drains.

Needle-nose pliers can be used to pluck out old wicking or adjust the height of wicks. A rag to wipe up a mess or wipe down an engine should occupy one corner of the box. Cotton is probably the best material, and an old T-shirt does the job nicely.

For lighting up, matches are just the thing. I carry around several books of paper matches, though I find wooden matches to be more convenient. Rod Wentler of Berkeley made a swell lighting-up tool. It's a piece of 1/8" OD brass tubing, turned up 90° at one end, with a wooden handle at the other. The upturned end receives a cut-off Q-Tip. This is dipped in alcohol and lit, and it is able to reach well up into just about any firebox. Since alchohol burns at a lower temperature than the cotton tip, if the fire is extinguished quickly, one tip will last a long time. Spare tips are kept in a small plastic bag.

A dentist's mirror is a wonderful thing to have around to verify the condition of the fire. If you are on good terms with your dentist -- which is always a good thing when it's time for a root canal or some other unpleasant way of passing the hours -- he may have some old ones that he'd donate to the cause. Once a little pressure gets up, the handle of the mirror can be used to offer the engine encouragement by lightly tapping its pressure gauge. The needle-nose pliers can again come into play when they are used to tweak the safety valve to insure its willingness to work properly.

There is no end to the tools you might have on hand to maintain your tiny iron steed. Many engines come with tools specific to their needs. A removeable water-pump handle, for instance, custom made to fit the pump's stub; or a special wrench to adjust the feedwater rate, as supplied by Maxwell Hemmens.

Generally, a set of small screwdrivers and another of small wrenches should handle most emergencies. One of those screwdrivers with a magnet stuck in the end is invaluable for inserting Aster's steel screws into hard-to-reach holes. Screwdrivers and wrenches that specifically fit your loco's various fasteners and underpinnings are obvious items for your toolbox. Allen wrenches for same, as well.

Mamod owners may want to carry around a throttle extender to make driving easier. Aster supplies white cotton driving gloves with their engines, but the more hardy amongst us may disdain their use. A piece of wire to use as a coupling hook may be useful, and another to act as an emergency coupler may also be welcome.

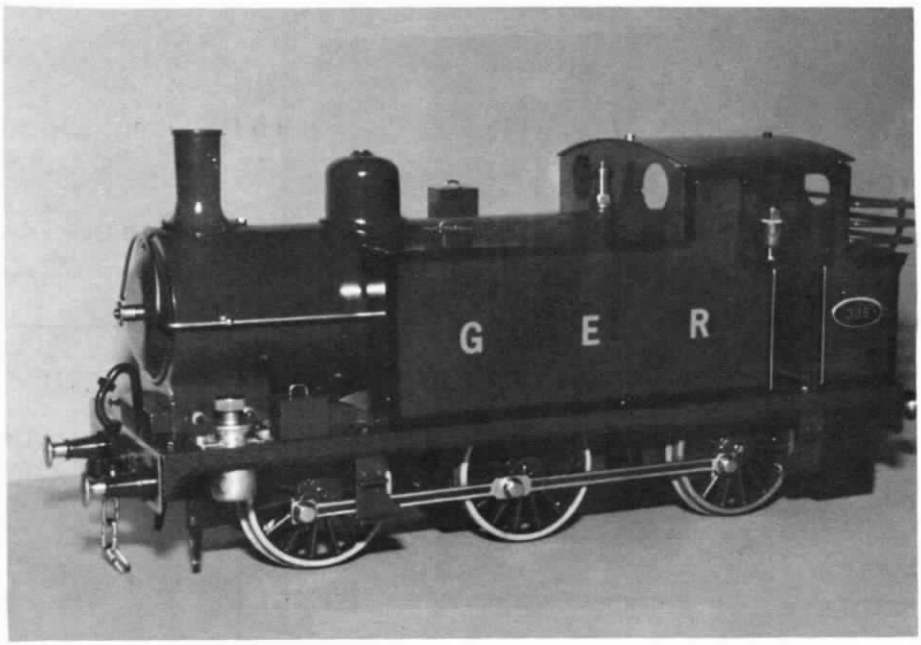
There is a product on the market called Dust-Off which is, I think, just CO_2 in an aerosol can (check your local photo supply store). It's a little pricey, but I've seen it used effectively to extinguish fires. It's especially useful on engines whose fires are hard to reach or difficult to douse.

So there you have it. I hope I've not inadvertantly excluded anything significant. No doubt you'll come up with additional tools that satisfy your personal needs (or those of your engines). A well equipped toolbox is indispensable to harmonious living in the company of diminutive steam locomotives.

Some Changes and Adjustments to the Aster 0-6-0

by D. Barry Harper

My Aster 0-6-0 was built from the kit with no particular difficulty until the fitting of the foot (bottom) plate/superstructure assembly over the main frame assembly. As I expect all 0-6-0 builders have found, it is necessary to bend the copper pipe on the lubricator up fairly sharply to avoid the oscillating cylinder and to connect to the steam pipe on top of the engine block.



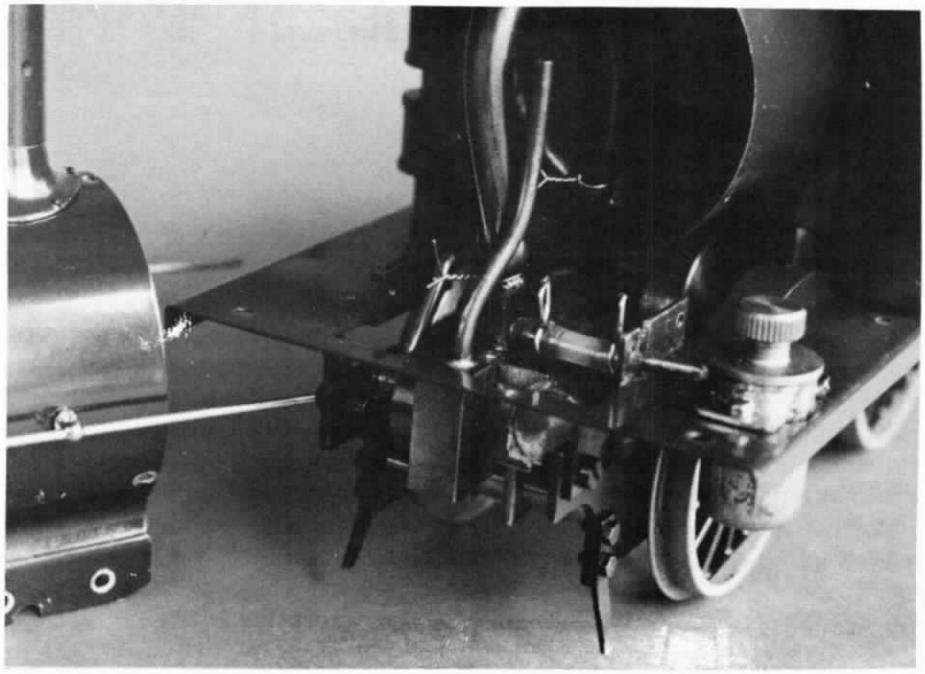
Above: **Aster GER 0-6-0**, a fine looking loco and the subject of this article.
Photo by D. Barry Harper

The first trial run was in 1987 at the New Jersey Live Steamers Gauge 1 track in Boundbrook, NJ. After some difficulty it was able to pull two Tenmille wagons when running in reverse. In forward it just pulled itself. A couple of fires were experienced and the plastic steam supply hose blew off the steam pipe. A helpful steam enthusiast gave me a piece of neoprene hose and some wire to secure the hose at each end by making a wrap or two around the hose and then twisting the wire tight.

Over the years since, a number of changes and adjustments have been made which may be of interest.

1. The fact that it ran much better in reverse than forward suggested that there was a problem with the oscillating cylinder valve timing. The piston and rod were removed from the engine (this can be done without disassembly by springing the rod off the crank pin at the outer end of the throw). The rod was carefully bent so that the piston center line was as close as possible to being aligned with the crank pin hole. Reassembly and testing showed improvement, but still showed better timing in reverse than forward. A second adjustment, bending slightly further in the same direction, resulted in satisfactory forward running.

2. The fact that the lubricating oil has to make its way uphill from the lubricator to the cylinder via the bent pipe referred to earlier



Above: Detailed view of some of the modifications made by Barry and described in this article.

Photo by D. Barry Harper

seemed to be undesirable. As can be seen in the accompanying photos, the lubricator was removed from its position under the footplate. Two brass flanges were soldered to the sides of the lubricator at a location that would position it to make a level oil connection to the cylinder. The hole in the footplate had to be enlarged to take the body of the lubricator, and holes were drilled to allow the lubricator to be secured in its new position. To allow assembly it was necessary to slot the flange that holds the smokebox, and to slot the bottom edge of the smokebox. This can be seen in the photo.

3. In an effort to keep as much of the burner's heat in as possible, a layer of insulation was added to the outside and ends of the firebox side plates. The insulation used was left over from another Aster kit. The insulating layer was covered with aluminum sheet. A piece of aluminum flashing was used and cut to match the side plate and the ends. The aluminum was secured with the same nuts and bolts that hold the firebox sides to the firebox ends, and the small end pieces were bent over the end plates. Because this new arrangement was about 1/16" thicker on each side than the original, it was tricky to assemble the footplate/side tanks over it.

The engine will now pull six or seven Tenmille wagons for its full run. Just how much of the improvement is due to running in and how much is due to the above changes cannot be said.

The occasional fire is still a problem with this engine. The plastic fuel filler tube comes well up in the rear of the engine. I think one of the problems is that the top fo the wick tubes on the burner are about level with the fuel level with a full fuel tank. In the process of filling through the filler tube, some fuel probably momentarily overflows the wick tubes when the "full" overflow is seen. This overflow catches fire when the wicks are lit. One solution seems to be to let the loco sit after fueling. Fill the fuel first, then the water and oil. This will give time for any unseen spill to evaporate, and even lower the level in the wick tubes slightly.

Locomotive Review - Wrightscale Porter

by Eric Lloyd

Description: Model of a turn of the century 8 ton Porter saddle tank locomotive as supplied for mining, logging, contracting and shortline railways all over the U.S.A. and Canada. The loco is similar to that modelled by Grandt Line in their 1/4" scale kit, and to the locos that operated on the author's favourite railway, the "Huntsville and Lake of Bays" in Canada.

Price: U.K. price £800 - U.S. price will fluctuate with exchange rate

Available from: ***In the U.K.*** - WRIGHTSCALE of Aboyne, Burnside, Aboyne, ABERDEENSHIRE, AB34 5ES U.K.
In the U.S. - Railway Garden Ltd., 4210 Bridge St., Cambria, CA 93428 (805-927-1194)
West Lawn Loco Works, P.O. Box 570, Madison, WI 53701

Technical Specifications:
Scale - 16mm = 1' (1:19)
Gauge - 45mm (gauge 1) or 32mm (gauge 0)
Length over beam - 8"
Width - 3-3/4"
Height - 5-3/8"
Weight, RTR - 4.5 lbs.
Boiler - fired by gas (butane), hydraulically tested to 120 psi. It is a centre flue of all silver soldered copper construction, fitted with fine control regulator, pressure gauge, safety valve, and vacuum-filling tap with a working capacity of approximately 75cc of water. The vacuum filling tap may also be used as a boiler blowdown valve.
Cylinders - two double-acting with slide valves
Bore & Stroke - not given
Valve gear - slip eccentrics on driving axle
Lubrication - displacement lubricator in cab, fitted with drain plug below cab floor
Duration - 20 minutes
Control - manually controlled by easily accessible fine control regulator (it appears that radio control could be fitted to the throttle quite easily)
Couplers - link & pin as per the prototype

This model is of a typical turn of the century Porter as built with the short smoke box and spark arresting diamond stack. In order to obtain scale appearance, great use has been made of lost-wax brass castings and photo-engraved brass parts, which has resulted in what I think is the finest production model of a U.S. narrow-gauge loco in this scale. The finish is black enamel with boxcar red roof, surmounted by a lost-wax cast whistle mounted on a sleeve which slips over the top of the safety valve.

The frames are lost-wax castings, complete with all the detail - the brake gear being a separate casting, again incorporating all the detail. The main and side rods are made of steel. The cast smokebox has an opening door (used for lighting burner) and this is surmounted by a diamond stack with ash-clearing door and rivet detail, together with a detailed oil headlight and bracket. The typical high pitched Porter saddle tank is made up from photo- engraved brass fixed to the smokebox as per the prototype. This is fitted with a bell and bracket, functional water hatch, sand dome and pipes. A handrail and step are fitted to one side of the tank to enable a 16mm engineer to fill it with water. The saddle tank is fully functional and holds approximately 80cc of water. It is connected by small-bore copper pipe to the vacuum filling tap mounted on the boiler backhead.

The typical large cab is made from photo-engraved brass and has handrails fitted at the rear. The finishing touch is a vented sleeve which slips over the safety valve and has mounted on it a beautiful

lost-wax whistle casting. The couplers are cast multi-height link & pin, and foot boards are fitted front and rear.

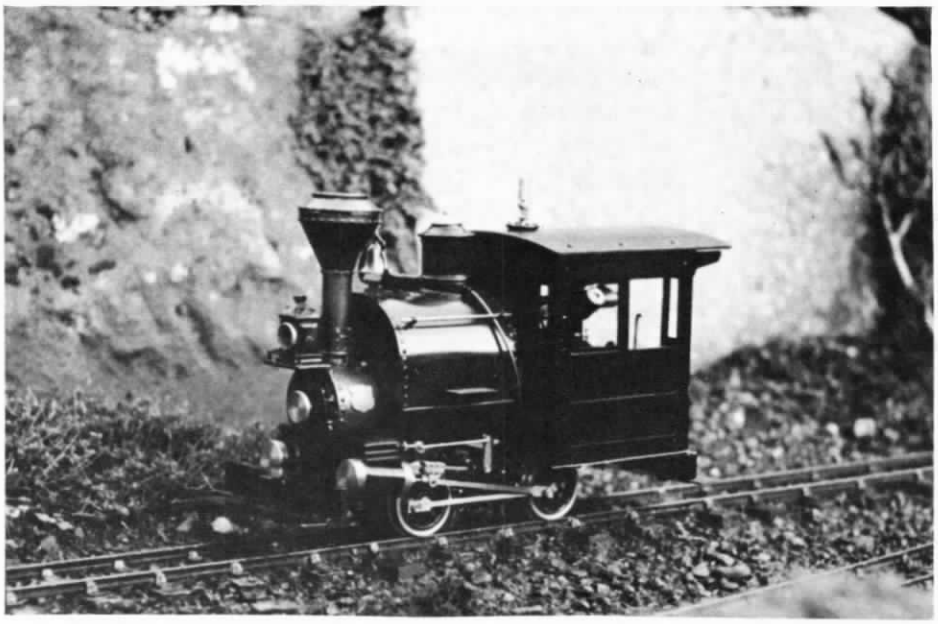
After drooling over the appearance of this loco and reading the instruction booklet, I got down to the nitty gritty of running it. This I commenced by oiling around all the moving parts, especially the slip-eccentrics and the valve rockers. For this first run the safety valve was unscrewed (2 BA box spanner) and 75cc of water was put into the boiler with a veterinary syringe. The safety valve was then replaced and nipped up. At the same time I put 85cc of water in the saddle tank, ready to top up the boiler at the end of the run. The lubricator was filled with thin steam oil and the gas tank filled per instructions. The smokebox was opened up for lighting and the gas valve opened. DISASTER! The gas feed pipe had split in transit just above the entrance to the burner. A phone call to Malcolm Wright resulted in the prompt dispatch of another burner with a coiled gas pipe. In the interest of neatness the original pipe had been made as short as possible and had consequently work-hardened. With the coils in the new pipe it was easier to fit and flexible. This should prevent work hardening of the copper piping. Malcolm tells me that all the locomotives in this batch and all subsequent engines will incorporate this modification.

Back in business and outside on a chilly November day, the gas tank was again topped up and the burner lit. It took 10 minutes to get 25 psi on the clock. The regulator was cracked open and the cylinders warmed and cleared of condensation (do not have your face in line with the top of the stack while doing this operation because the water/oil mixture ejected from the stack is very hot). A short run warmed the cylinders to operating temperature, then I got 16 minutes of running in both forward and reverse. The regulator permits a very sedate pace and the performance was equal in forward and reverse, a must on a short out and back railway like mine. Incidentally, the loco has a pronouced chuff and good steam effect, both of which add considerably to the realistic operation of a steam loco.

When the gas ran out I closed the valve to the burner, drained and refilled the lubricator and lightly oiled round, then refilled the gas tank for the next run. By this time the boiler had cooled down, so I opened the vacuum valve and refilled the boiler from the saddle tank. Vacuum valve closed, I relit the burner and topped up the water in the saddle tank for the next run. Again 10 minutes to get 25 psi on the clock, condensate cleared and another 16 minutes of superb sedate running. At this point the light gave out on me, so I returned to the workshop to empty the lubricator and wipe down the loco for the next run.

Some 4 years ago I purchased one of the first batch of Wrightscale 's Kerr Stuart "Wren" Class 0-4-0 saddle tank locos, and when Malcolm delivered it and gave me some driving pointers I mentioned that I particularly liked the Porter 0-4-0 saddle tankers. He was interested, so I gave him some photocopies of the drawings of these locos that I had accumulated and the end result was this marvelous model which has made a reality of my dreams from 4 years ago.

Epilogue: I have several more runs on my Wrightscale Porter since writing this review and I am delighted with its performance. It is a great little loco!



Above: Wrightscale Porter poses for the camera before going to work on Eric Lloyds' Lloyd Country Railway in Wales. Eric says that this smooth running little loco puts in a hard day's work and delivers excellent performance on his point-to-point railway. ***Photo by Eric Lloyd***

Building Engines

by Malcolm Wright

Evolution of the Wrightscale Porter

I hope you will find some points of interest in reading this, in that I intend to let you into some of the "secrets" of the trade, so let us make a start.

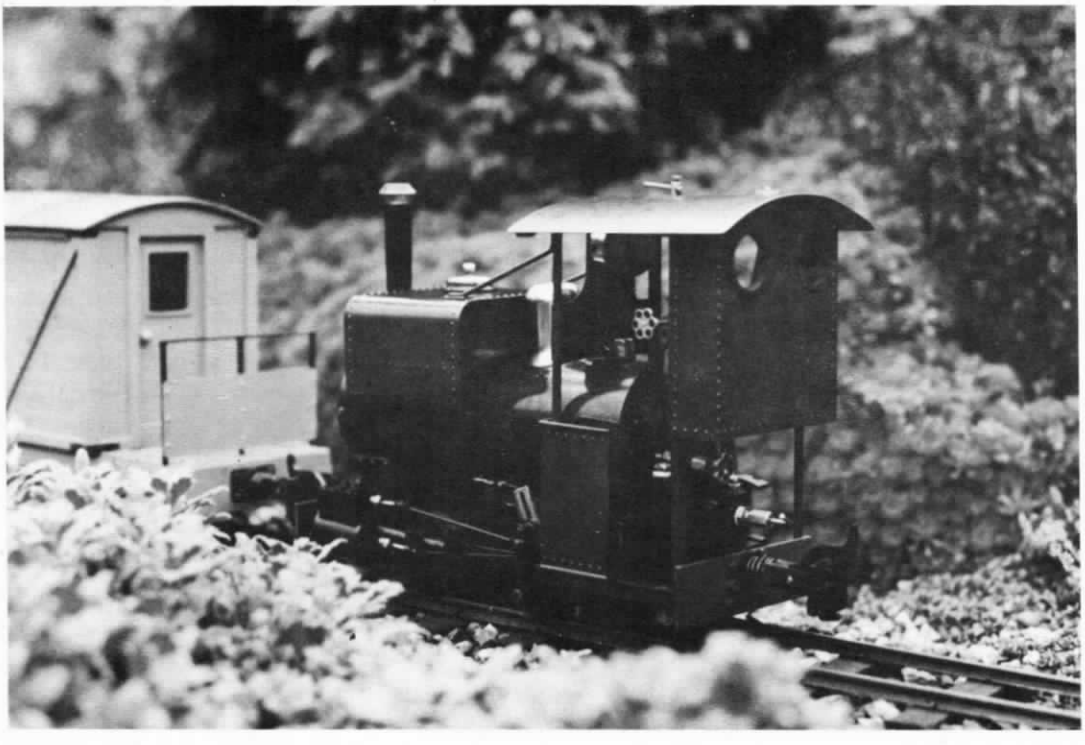
I began the manufacture of 16mm steam engines about six years ago. At first it was a hobby, but somehow in the building of my first engine, a Kerr Stuart Wren (see photo), it turned out that I had crossed some bridges that people in the hobby thought were not possible. It was small, it was gas fired, and the burner was silent. The obvious had occurred, my hobby had produced a product. I decided to build a small batch of engines for various friends who were twisting my arm for one. In doing this I learnt a lot, and two years later I had built 26 Wrens.

It was then that we decided it might be possible to make a small living building engines and producing kits, and so Wrightscale proper was started.

I identified that the British market was too content with steam driven "bricks", so I looked for a market where scale was everything. Having modelled the Sandy River and won many prizes for the layout I did not have to look far, just about 3000 miles to the U.S.A. The first stage of research in 1988 showed promise. There were only a few models made by Aster, these were expensive and, at the time, variable in quality of running.

What amazed me was that there were no small scale producers in the U.S. or Canada. Nobody in this country was interested either. Roundhouse at the time had yet to produce the Fowler and were busy flooding the British tracks with their well running, large, generic narrow gauge locos.

I still think the U.S. garden modeller is poorly served



Above: Wrightscale's Kerr Stuart **Wren**, Malcolm's first attempt at building small-scale live steam models. This outstanding locomotive established Malcolm Wright as a builder with a reputation for models that are accurate, of high quality and with excellent running characteristics.

Photo by Malcolm Wright

and exploited on price. It is only now that we see some producers in the U.K., in Australia, and in the U.S. itself making engines available in the garden scales. However, some of these engines are not scale models, they are just an "Americanized" standard chassis. I decided something better was needed and that there would be a small but growing market for it.

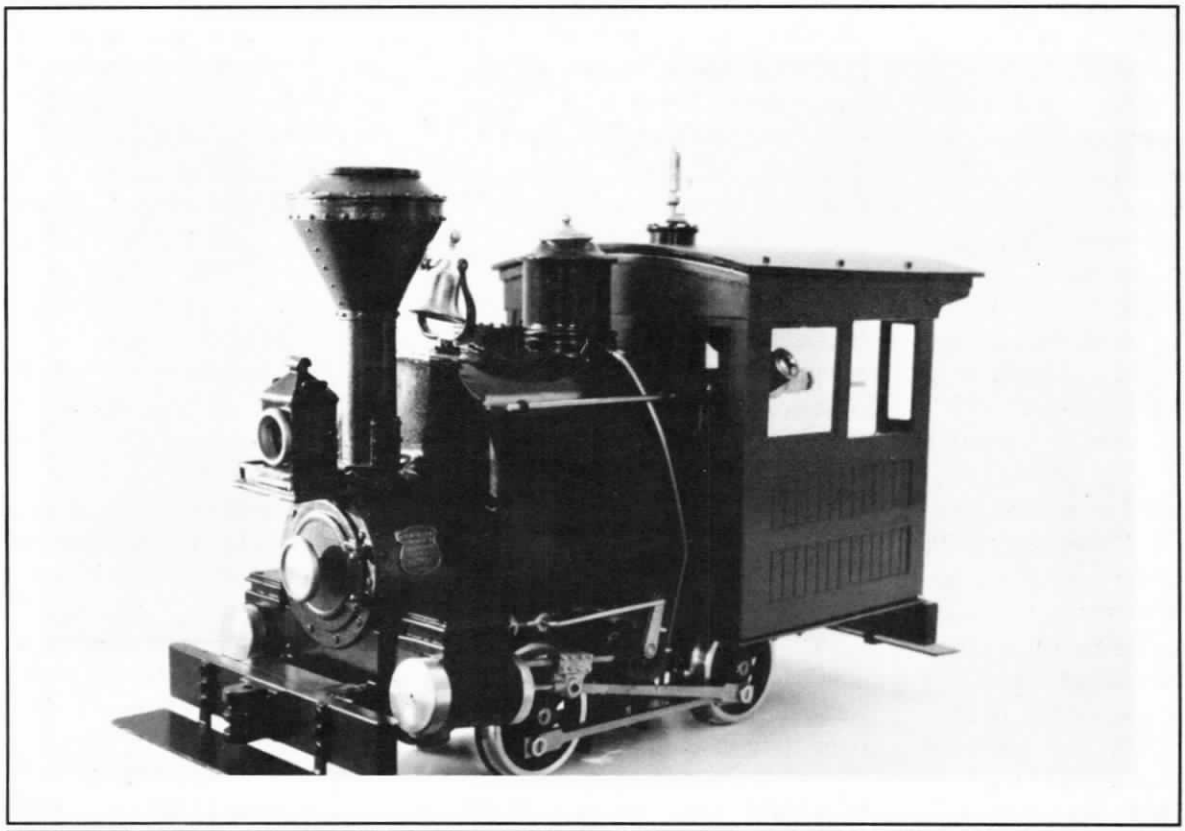
Well.....what to build? Do not forget that when I choose to build an engine, potential to make an accurate and profitable model is the prime consideration. It was now that I met Eric Lloyd and Peter Olson. I explained my wish to build for the U.S. market and they both suggested the same engine, a small Porter. Now what had to be fixed was the scale. The choice was 16mm to the foot (1:19). I chose 16mm for two reasons. One was that the majority of U.S. modellers used LGB track, and at 16mm to the foot the scale to gauge ratio of the model would be slightly closer than in 1/2" scale; secondly the prototype was very small, so would not look out of place beside an LGB locomotive.

The design specification was: a scale model, detailed to a high level, durable and solidly made. Gas fired, manual control, with a duration of 20 minutes. The boiler, like that on the Wren, can be refilled from the tank (I hate engines that need boiler fittings to be unscrewed, they seem so toy-like). Most importantly was a retail price of about $1500 (1988).

The decision was made at a good time, because I was starting to make castings using the lost wax process, and my caster, who makes replica drawer pulls and finger plates for the antique restoration trade, was always interested in a challenge. So I decided to use cast frames. But where would I get the information to make the masters? None of the drawings were detailed enough for me. This is my problem, I am a bit of a perfectionist. For example, what was the shape of the cotter that retained the spring end?

You see, when making a master, you save no time by making it wrong when a little research will let you make it right! To cut a story short, I found that the research had been done for me. In fact, I could "own" the real engine in the shape of the most magnificent model I have ever seen, the Grandt Line kit of the Porter in "O" scale. A kit was purchased and the parts studied and measured. I then prepared the masters for the caster. He found these were larger than any of his investment pots, and had to build a new rig to produce the castings. He fortunately found this fun. It was a challenge for him to produce the frame castings with no differential shrinkage. Suffice to say he succeeded, and now for the first time I was amazed to have suddenly a supply of parts just as detailed as my original, but now in one solid bit, not the 30 parts that went into each master.

From the point of design for manufacture the frame needed a datum. This



Above: The 8-ton Porter in 16mm scale, an excellent choice for a small, affordable live steam model for the American market. That's the gas filler valve showing in the cab window.

Photo by Malcolm Wright

was the valve drive pivot. On receipt, the frame is drilled and reamed at this point, then dropped into a reversible cavity jig. A pin through this hole indexes the frame whilst it is drilled for the axles. The drill is guided by hardened bushes that are spaced by another jig that is itself used to mill the rods on an engraving machine. This ensures that the rods are identical to the axle spacing, and therefore allows the chassis to be built with the minimum of fiddling. The chassis sides are erected to each other using a further jig. Why all the jigs? Even if you build only one engine some jigs are worth making. They can be simple, like a jig to locate the crank throw, or complex, such as the tooling I use to bore the handed cylinder castings. To set the casting using one-off methods takes 10-15 minutes. To machine it, 1 minute. With my jig system the times are, respectively, 30 seconds and 1 minute, and an added advantage is that the finished cylinder is interchangeable with any other.

However, I am running ahead of myself. The other patterns were the wheels and cylinders. The cylinders were the most difficult to design, since I wanted a system where, like the real engine, the saddle was a major part of the construction. Further, I wanted the motive part of the engine to detach as a module, with simple steam connections that were easily accessible both on and off the engine. The cylinders also had to be accurate in appearance. So some fine work was involved in making the ornamental valve covers with their beaded edges. When painted they do not really show, but it's nice to know that they are there. In construction, the finish bored and faced cylinder is sweated, using a high melting point lead solder, to the saddle. A key piece and groove ensures alignment. At the same time the inlet T is soldered into both blocks. The assembly is then face milled to ensure the valve faces are both at the same height and both parallel to the frame.

The ports are used as cast. They are 1/16" inlet and 3/32" exhaust, the land between the ports being 1/16" also. All the ports are 1/8" wide. The slide valve has some lap, 0.025" +/- 0.005". The piston rings are viton rings running in accurate grooves. I have found that "O" rings only last if the manufacturers technical information is followed. In fact, it is one of the few parts of the engine made to 1/1000" accuracy. I do not use "O" rings in the glands. Experience shows that the best results in these small models comes from using a twist of PTFE tape. Glands packed this way on my own engines are still steam tight after 5 years with no adjustment.

If you have read this far you will realize that we have come to that stage of construction that still pleases me, the air test (photo 6). I am always amazed when that assembly of castings and metal strip moves for the first time. I still find it a source of pleasure to make something that moves. Running a chassis on air is useful. It does bed parts in, but it tells you nothing about how the chassis will operate on steam. The compressor has limitless blow compared to the little boiler, and it has not got the ability of steam to find each little leak and flaw in the soldering. So remember that an air test is an indication that you have built a runner - but not proof.

The valves are operated by slip eccentric gear, the travel being 3/16". I chose not to build the standard engine with the inside link motion on two grounds. One is cost - the time taken to erect this gear would add 30%-40% to the price. Secondly, in the running I have done and seen by others, I have not seen much shunting. Therefore I thought that the small push required to reverse the engine would be acceptable to 99% of users.

We now come to the heart of any engine, the boiler. In our scale the heart is a combination of boiler and burner. Where I can really help the aspiring builder is to pass on what I have found out about burners. I think also that I should own up to the fact that I am not an engineer, but an ex-molecular biologist turned teacher. Therefore I enjoy experiments that do not work and tasks that are near impossible. It is with this in mind that one should approach gas burners.

A summary of six years is this - the simplest burner is the gas poker. It should have a diameter less than 1/4 that of the flue. It should be placed below the centre of the flue with the flame holes or slots facing the flue wall. The superheater should be on the opposite side. The length, the spacing of the slots, the size of the air mixing port, and the size of the air holes matter very little. What matters is the jet. We use these burners in a situation that the designer of the jet did not foresee. The application makes the quality of finish of the jet, and its axial placing in our burners, critical. Therefore, what seems a hopeless burner needs only to have its jet changed to transform its performance. Tony Sant and I (Tony makes the burners and boilers for Roundhouse) find the same thing. Half the jets we buy in are not good enough for our use.

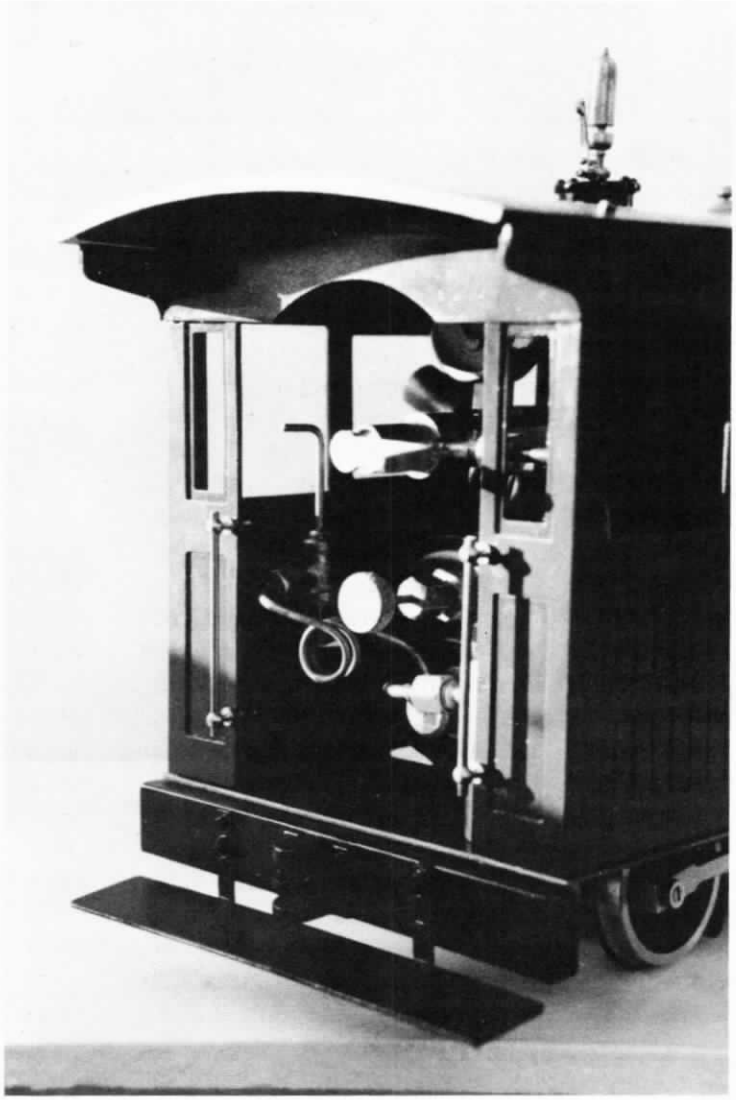
Other burner problems include noise. This can be cured by killing resonance in the flue. Move the superheater until it touches the burner or flame. If the flame won't suck back onto the burner, the jet is useless or partially blocked. If the flame is not stable on the burner, it is because air is leaking into the flue from the cab end. Why am I telling you all this? Well, it's to help any builder who is defeated by the burner. If these hints do not help,

write to me with the symptoms and I might be able to help in a more specific way.

I have tried different arrangements for lubrication, now I use a displacement lubricator after the regulator. The hole in the steam pipe is No. 79. Again, this is part of the engine that has to work since the life of valves without lubrication is hours rather than years.

The rest of the engine is made from more lost wax castings and chemically etched platework. Again the philosophy was to try to make th eengine as accurate as possible. I can only stress that the difference in time between making the right part and a "simpler" part is negligible. From the point of producing a saleable product, the closer it is to the drawing the less excuses are needed and the easier it is to sell.

Will the Porter be available as a kit? Not in the short term. A manual to describe how to build the engine that covered every eventuality and explained every term without ambiguity would take a long time to write, and without such a manual I could not ensure success for the builder. I would rather spend the time building, which takes me to the final point - new products. The sole craftsperson has a problem. How many objects do you make before changing the product? In the U.K. market the answer is 20-50. So I always have to be thinking of the next engine. At the moment, two are in development. A Baldwin 4-6-0 tank that uses laser cut frames; and longer term, a 3-foot gauge American 4-4-0. Another branch of my business is kits. This year I have produced three, all World War One rolling stock built by the French. Planned is a kit for a Baldwin 50hp gas engine, again from WWI. This development of new products is the most interesting part of the business, justifying the purchase of books, field trips, and most important of all, making new contacts who seem in our hobby to be pleasant and interesting people. Happy steaming!



Above: Cab and backhead detail of the Wrightscale Porter. Visible in the cab are the burner control valve, gas filler valve, steam valve (throttle), pressure gauge, and just a bit of the burner and displacement lubricator. Notice the coil in the gas supply line to the burner. This helps prevent stress fractures in the copper tubing. Notice also the fine etching job done on the cab parts, particularly around the windows and in the wood paneling on the c ab sides. Brass handrails, brass whistle casting and link & pin coupler are all nicely done.

Photo by Malcolm Wright

A Mountain Grade for Lady Anne: The Feasibility Study - Part II

by George Lyon

The next step in a feasibility study was to create a topographic map of the available sideyard. The area was staked out in six foot squares using aluminum cans as stakes. North-South coordinates were labelled A through E, and East-West 1 through 9. B2 was selected as the benchmark.

The following table could have been developed using Lima's "tightly drawn level line" technique. Since I had a hand level and a six foot length of aluminum angle striped with three inch tape in contrasting colors that could be placed vertically at B2, the table was actually created with a line-of-sight modification of Lima's method. The same six foot aluminum angle with a level taped to it could have been used with Lima's straightedge prescription for determining vertical distance, working downward from stake to stake and mathematically adding the results to produce the table's "drop below benchmark" contents.

	A	B	C	D	E
1	+1	0	X	X	X
2	0	0	0	X	X
3	-1	-1	0	-1	X
4	-3	-3	-5	-3	-6
5	-9	-9	-12	-12	-12
6	-12	-15	-18	-18	-15
7	-24	-18	-27	-26	-24
8	-30	-24	-30	-33	-30
9	-36	-36	-33	-33	-31

Graph paper was manufactured using the S gauge (3/16" = 1 foot) side of my metal modeling ruler and a map was drawn on the graph paper by referring to the above table. A local copy shop then furnished copies of the map, whose contour lines are designated at the margins as negative values, reflecting inches below benchmark B2 (near Z).

Another version of the Lime Ridge is shown on map 2. It illustrates an optimum grade descending from Y to P. The rail route (R) is 101.6 feet, or 1219.25 inches. The vertical distance (V) is 30 inches. R/V yields 40.6, roughly 1 in 40, or 2.5%. ZZ and PP could be small yards, and SU a passing siding.

This second map shows that significant parts of SU and SR will be in a cut. Arc QP requires reevaluation, since ground level with an acceptable grade is reached at Q. Lawn care would be a challenge. The 2.5% grade exacts a heavy toll, to be paid only if Lady Anne fails tonnage rating trials on the False Pass' 4% and 4.5% climbs up to Apex and Zenith.

Crudely drawn on a crude map is one of several possible versions of the B&LRN. "Crude" is good enough; this is a feasibility study, not a staked grade awaiting contractors bids. UZ is a 72 foot continuous-run oval, and UP a 55 foot branch. Run-around sidings at ZY and OP, and the use of UK or US as stub sidings permits opposing train movements on UZ or PUVZ runs. Area H awaits a yard, and steaming bay G enjoys afternoon shade from nearby tree T. (FB is an established flower bed.)

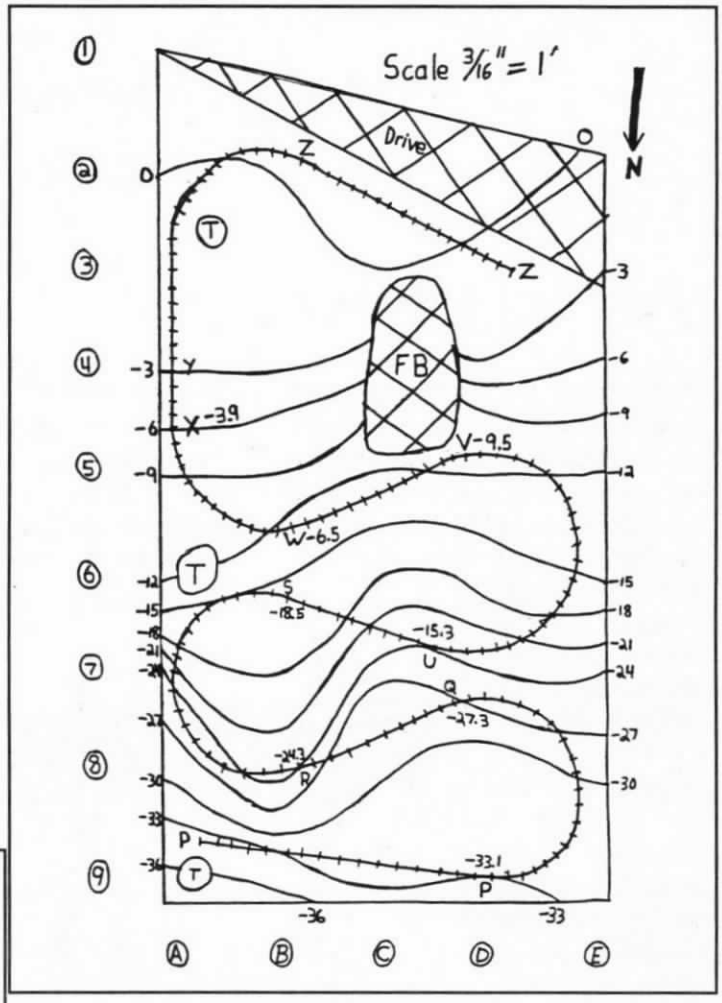
The horticultural feasibility study reveals good lawn mower access to all areas. If ambition dictates, the areas enclosed in part by arcs SR and QP can be converted to garden, creating a scenic route of great beauty for "ladder" UP. This would, however, demand considerable committment, some botanical expertise and an artistic eye in plant selection, and skillful planning of walkways to preserve access to track and plants.

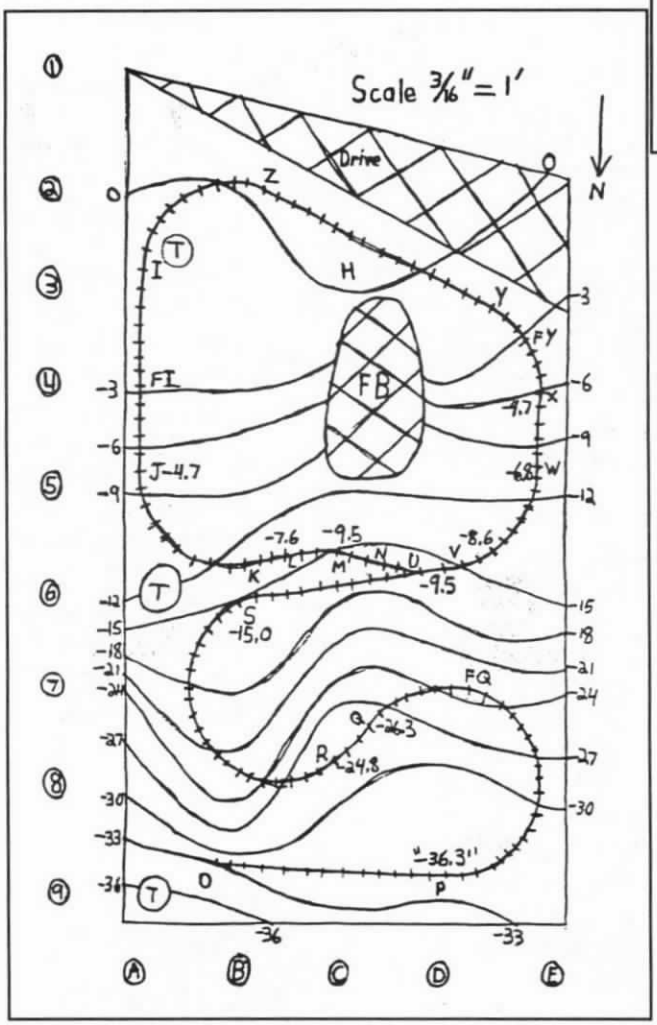
This story is about a mountain grade, and adjacent to the track are negative values (e.g. W is -6.8, reflecting the track's vertical distance below benchmark B2). FY to W to PQ is a 4.2% (1 in 24) grade, and FI to M a 2.8% (1 in 36) slope. Calculations on tangents went as follows. Tangent US is 11 feet or 132 inches long as measured directly on the map. 132/24 equals 5.5 inches. Since U is 9.5 inches below benchmark, S will be 5.5 inches lower at -15.0. On 4.2% 60 inch radius curves, a different method was used: (a) 2XpiX60=377 inches (31.4 feet) of circumference (b) 377/24 = 15.7 inches of "drop" in a full circle (c) Arc SR is measured as 225 degrees of curvature (d) (225/360) X 15.7 = 9.8 inches of "drop" from S to R.

Study of the map shows that 6.4 inches of fill will be needed at U, S will be at ground level, and arc SR will demand acceptable amounts of fill. Somewhere near Q the 4.2% grade down from Q will reach ground level, and a gentler grade on to P can be used.

My vision of the side yard is nearly complete with Lady Anne battling up the 4% to Zenith. The track remains slightly out of focus, but a technology transplant from the backyard will remedy that. On the FP&B, sections of LGB track have floated through seven Zone 4 winters on a (thick) layer of ballast which, in turn, floats on Mother Earth. Gravity holds it together, rail joiners providing only alignment. The ballast is spread prototypically - on the ground, not in a trench. (The retired locomotive engineer who helped lay the track advocated New York Central standards, where ballast provided drainage to ice-filled ditches parallel to the track, not beneath it.)

False Pass ballast is called "screenings" or "dust" at the local limestone quarry, and comes from the pile where 100% will pass through a 1/2 inch screen, and 90% to 100% through a 1/4 inch screen. Track-friendly stuff, it has not been frost-susceptible. The 0 gauge track system that will ultimately top more of this ballast will (except for code 250 rail) replicate LGB track sections, whose accurately prebent rail and sturdy ties form, in effect, horizontal plate girders where ties act as the web uniting the rails serving as cover plates.





The metal ties in the test sections of track will be cut from #10 Galvaneal ($3.76 a square foot at the local sheet metal shop) and protected with Derusto's Barbeque Black. Switches will definitely be metal-tied #5 sectionals, built on templates blown up from the accurately dimensioned plan of a 30 meter sectional switch shown in Richard Dunn's book. A doubled Template C shown on page 66 of the October 1969 Model Railroader will shape easement sections.

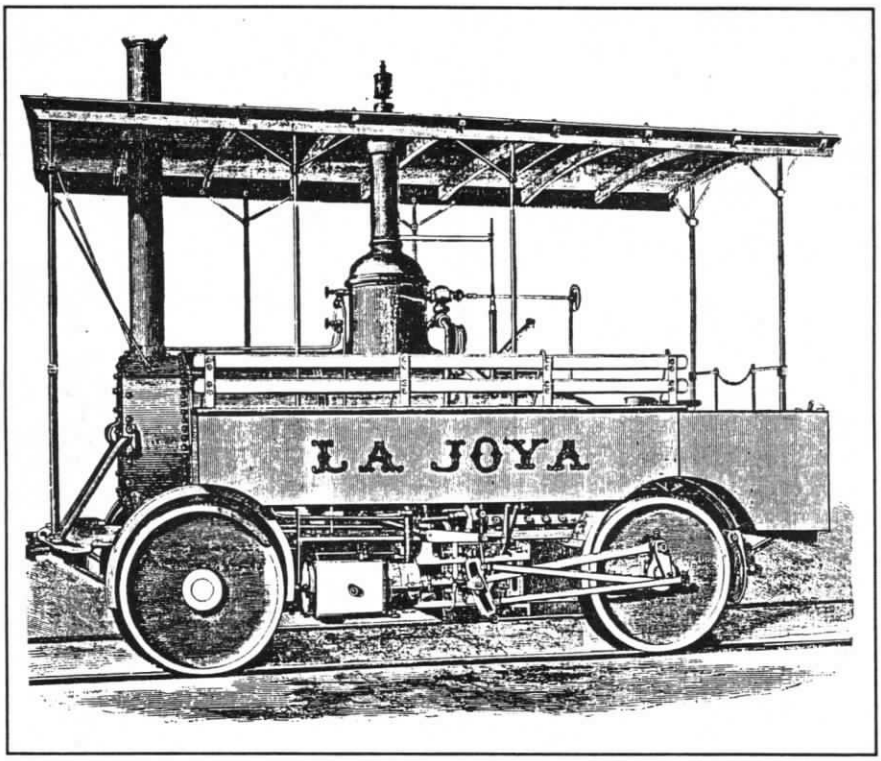
One of the many joys of garden railroading is that all the problems are real, and so are their solutions. Prototype practice shows the way: there is no need to reinvent the wheel. For those of you fortunate enough to have a steep garden, a level and "a tightly drawn line" are the beginning of a mountain division for small scale steam.

Walking Down Older Paths

by Peter Jones

Part I of a Series

In this, the first of a series, I hope to try something a bit different from the usual type of article. The plan is to take some old illustration as a starting point and use it to trigger off a train of thought about different types of loco development. But this won't be just for its own sake. Hopefully it will also stimulate a few ideas for modellers to think about; variations on more normal steam in the garden. To illustrate the concept, let's get straight on with the first example.



La Joya (The Jewel) was a steam inspection car built by Baldwin in July of 1869 for the Mejia and Arequipa Railway in Peru. It is a typical example of a whole breed of such things which appeared in a whole variety of forms down the years and around the world. The need was for a lightweight vehicle with sufficient power to carry a handful of officials around in a semblance of comfort - although some were less comfortable than others, it has to be said.

La Joya is of conventional construction, apart from solid disc wheels and the deep well tank. Conventional valve gear is very accessible and the design looks easy to service. It was common practice to use diminutive cylinders and motion - and these were often adapted from units designed for small river launches or stationary engines. These could be quaint and attractive vehicles and are well worth studying for their own sake.

But for us who ply our cause in the back garden, it could well be that they suggest a whole variety of similar freelance applications. Your chief engineer could build one specifically for your company. The scope for invention is tremendous. Years ago, I built something similar to The Jewel, albeit simplified. Power was from a little oscillating engine, driving only one axle vial a reduction gear. The boiler and burner came from a toy stationary engine by Mamod and there was no reverse fitted. This all happened a long time ago and I expect that if I could see the workmanship as it really was, I might be ashamed. But it was a working steam engine of great character; something difficult to attain on a young boy's modest weekly allowance.

We scribblers do our best to make starting into building steam locos as painless a process as possible, but there is no denying it is a big step for many. Thus I invite you to look at our little jewel again and ponder whether something like this might be an easy introduction to engine building - a sort of halfway house. You may well conclude that there is scope for further thought here. In such endeavours I offer my best wishes.

Calendar of Events - 1992

May 24 - 2nd Annual SitG Memorial Day Weekend Steamup, hosted by Bob & Judy Nowell in Jim Thorpe, Pennsylvania. Don't miss this one! Send a LSASE for more information and a map. If you'd like info on local motels, be sure to ask Bob to include it.

Bob Nowell
Woodside Drive
Jim Thorpe, PA 18229

Phone 717-325-8246 (before 9 p.m. Eastern time, please)

August 22 - 4th Annual Silo Falls Steamup, hosted by Ron & Marie Brown in Newark Valley, New York. Large ground level railway with 10' radius curves and fairly steep (4%) grades. Please send LSASE for more info and a map.

Ron Brown
P.O. Box 335
Newark Valley, NY 13811

Phone 607-642-8119 (between 5 p.m. and 10 p.m. Eastern time or anytime on weekends)

New Fire for the Hyde Shay

by Stumpy Stone

I purchased a Hyde-Out Mountain Live Steam Shay in the spring of 1991 and ran the wheels off of it! This is a neat little loco, but I wanted to extend the full power range beyond the duration provided by the Sterno Gel fuel supplied with the engine. This fuel is solid and burns down away from the boiler, thereby lowering the flame and yielding lower steam pressure as the run progresses. I thought about it and decided that if I could get the fire to stay up against the boiler, performance could be improved.

During a discussion with Charlie Roth, a steamboat builder who was at the SitG Steamup last May, the idea of putting sawdust in the Hyde Shay's fuel tray and using it to wick liquid alcohol up to the top of the tray was suggested. The alcohol would burn on top of the sawdust, keeping the fire up where it would do the most good.

When I returned home from the steamup I tried this right away - and it worked! I built a larger fuel tray/burner and it works just as well as the stock item, plus it gives longer duration runs. The burner described in this article has made it possible for my Shay to be run at full throttle with a full head of steam for 21 to 25 minutes while hauling 5 cars on my railway with its 4% grades. Four log cars and a caboose enjoyed a 29 minute ride, while 5 heavy freight cars went for 21 minutes.

Steam comes up from a cold water start in about 10 minutes, with warm water taking only 7 minutes. I did find that the displacement lubricator is out of oil in about 25 minutes, so I hold run length to about 20 minutes. I've also found that if I fill the boiler 3/4 of the way up the sight glass instead of full, steam is up quicker and performance seems to be a bit better.

To build this burner, start with a strip of thin brass, steel or tin 1-1/4" wide and 8-1/2" long. Next cut a piece 1-1/4" X 3-1/2". Now refer to the drawings, as you will need to cut out two sides using the "side pattern".

The long piece you cut out must be bent to form the bottom of the tray. Start by bending a front tray hangar area 1/2" long across one end. Then measure down 1-1/2" and make a 45 degree bend. Now you have the hangar area and the front slope of the tray. Measure 5-3/4" back and make a 90 degree bend to form the back of the tray. You can use the dotted lines on the bottom of the side pattern for a guide.

The short straight piece will need a 90 degree bend 3" from the end. This will be the top of the tray/burner with the upright bit forming the back of the opening in the top of the tray.

The dotted lines on the side pattern is where to bend these parts to form tabs to solder the tray together.

One more piece is needed to finish making the parts. The handle is a metal piece 1-1/2" long bent 90 degrees in the middle.

You're ready to assemble the tray, so refer to the assembly drawing now.

One more thing must be added to complete the project - a filler tube. This is a piece of 1/8" OD copper tubing 3-1/2" long. This must be formed so that it rests on the bottom of the tray and extends up to just above the edge of the tray opening by about 1/4". It should also be soldered in so as to have its lower end centered in the closed end of the tray. The reason for this is so that when you fill the tray with alcohol from you syringe, it will fill from the back to the front and you can be certain it is full. Just pouring alcohol into the tray wouldn't ensure that the tray would be full.

When the construction is finished, fill the tray with water and check for leaks. Repair them now! Paint the tray/burner with automotive engine or exhaust manifold paint.

Next you'll need to drill two holes in the frame of the locomotive just ahead of the cab steps. This is necessary to hold up the back of the tray. I used a length of 1/16" mechanics wire formed to hold the tray up. The wire should be formed so that the tray is suspended as level as possible. I first inserted one end of the wire through the hole on the engineer's side from between the frame rails. I then formed the end of the wire over about 1/4" to hold it on the outside of the frame. Then the wire was bent down 90 degrees to about 1/4" above the surface the loco was resting on. From there it was routed across between the frames and then up to the hole in the other frame rail and through it. I then formed it down toward the bench and looped the end to make a handle. Some re-forming was necessary to get everything to fit just right and aligned correctly once the tray was hung in place.

I used a soldering iron and regular lead/tin solder to build this tray and have had no problems with it.

The last thing to do before trying it out is to add the sawdust. Hold the tray at an angle with the closed end down and put the sawdust in a little at a time. Tap the tray to help the sawdust settle. When this area is full, put sawdust into the tray and

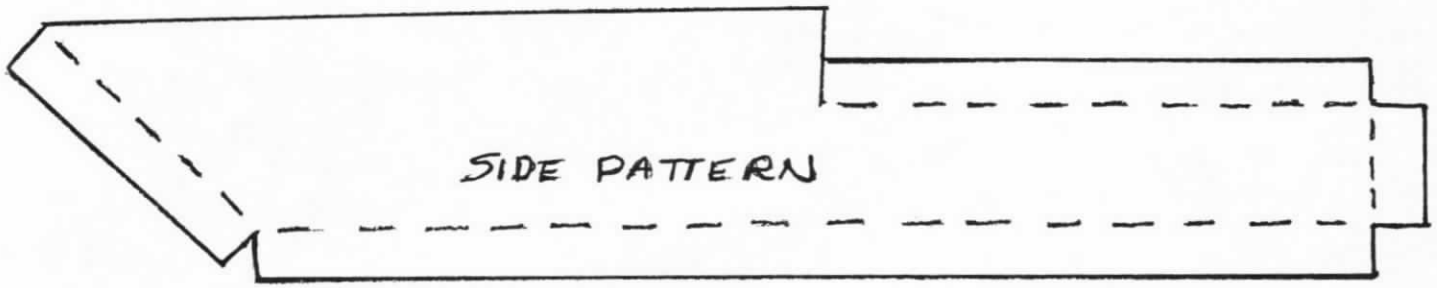
fill it to the top. Now pack this down using your thumb. You don't need to press real hard. Add more sawdust and pack again. Continue to do this until the sawdust is evenly distributed and about 1/8" below the top edge of the tray.

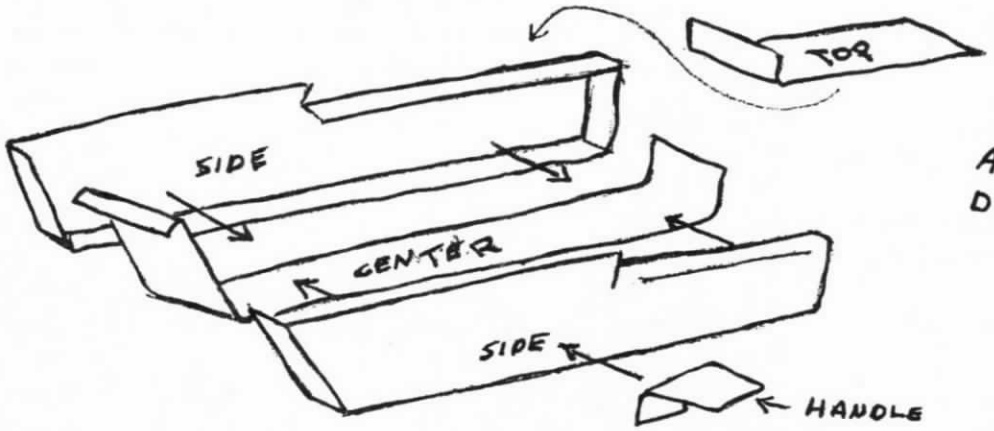
Now using the syringe and a piece of tubing, fill the tray slowly with alcohol. It will take about 75cc to fill it. Whe you see that the whole length of the sawdust is wet and just a little liquid on top of the sawdust, it's full. Allow the alcohol on top of the sawdust to soak in for a couple of minutes before installing the burner tray under the locomotive. Then light the burner in the usual way and you're in business!

Using a liquid fuel requires attention to fire safety. Keep a hand action spray bottle full of water (or a pail of small towels or washcloths in a bucket of water - ed.) handy to drown any alcohol fire that may start. Water combines with the alcohol and drowns it quickly.

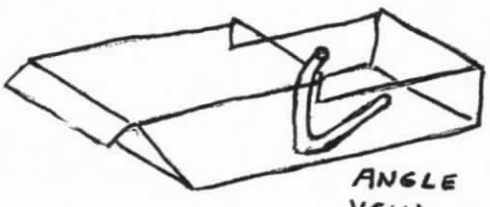
Never use gasoline or kerosene in an alcohol fired loco!

This burner modification and a set of Miniature Steam Railways replacement cylinders (this only refers to the early Hyde Shays, as they used Mamod cylinders and some of them didn't run very well - later Shays are all fitted with MSR cylinders and run just fine) will enhance the performance of this loco. You might want to contact Hyde-Out Mountain Live Steam or Miniature Steam Railways about the cylinder conversion. I'm quite happy with the performance of my locomotive after making this modification, and I think you will be too.

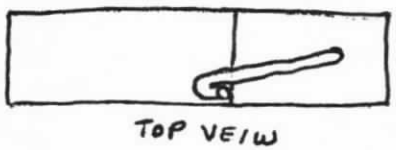




ASSEMBLY DRAWING



ANGLE VEIW



TOP VEIW

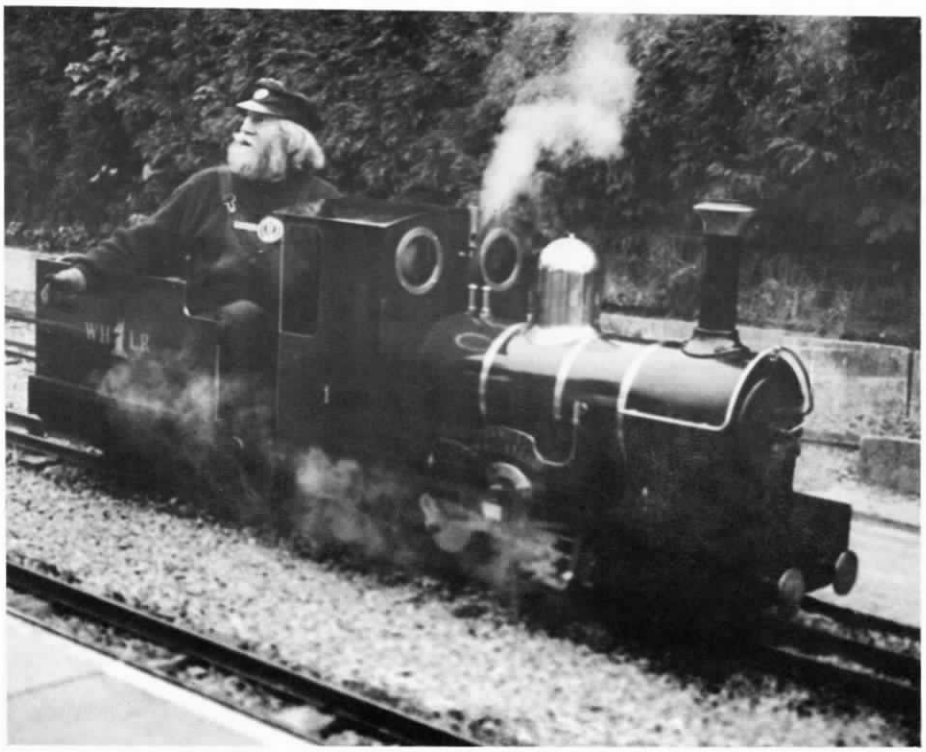
PLACEMENT OF FILLER TUBE

Steam Scene.....along the rails

This feature should have a whole new look now that we're using a higher quality process to get the photos on the pages. Read about it in the editorial comments on page 3.

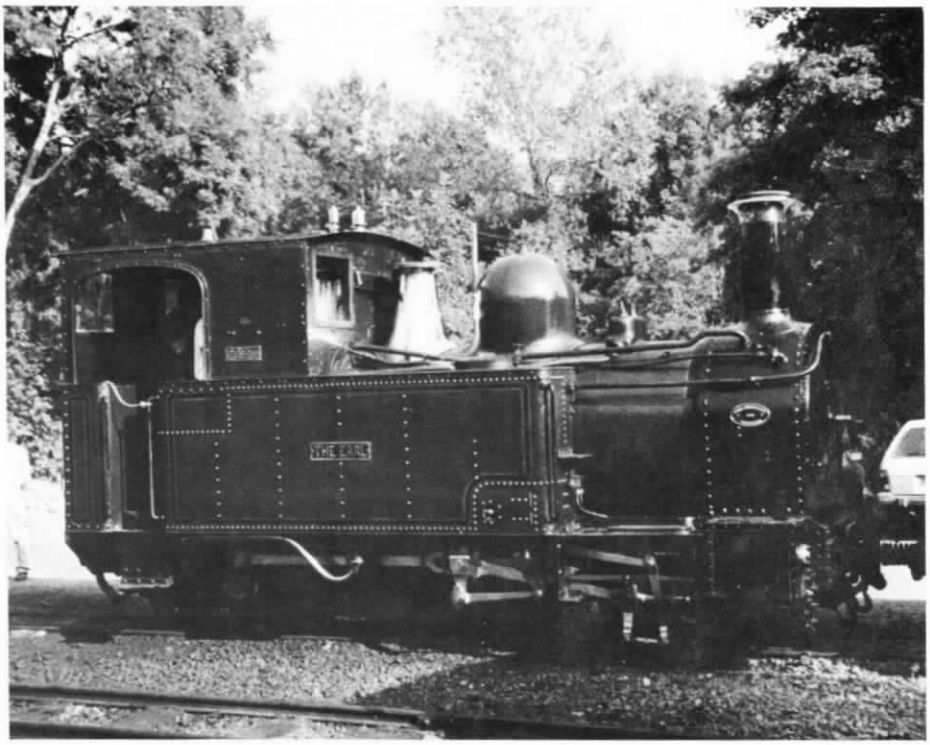
And the crisp, clear look is all the more reason for you to get those favorite photos out, put down vital information like photographer, subject, where, when and why. Then mail them in to SitG, P.O. Box 335, Newark Valley, NY 13811. Please include a LSASE with sufficient postage if you'd like your photos returned. And please be sure to affix a label to each photo with your name on it so we can identify the sender when your photo gets mixed into the pile with all those others!

'Nuff said.....let's look at some photos.

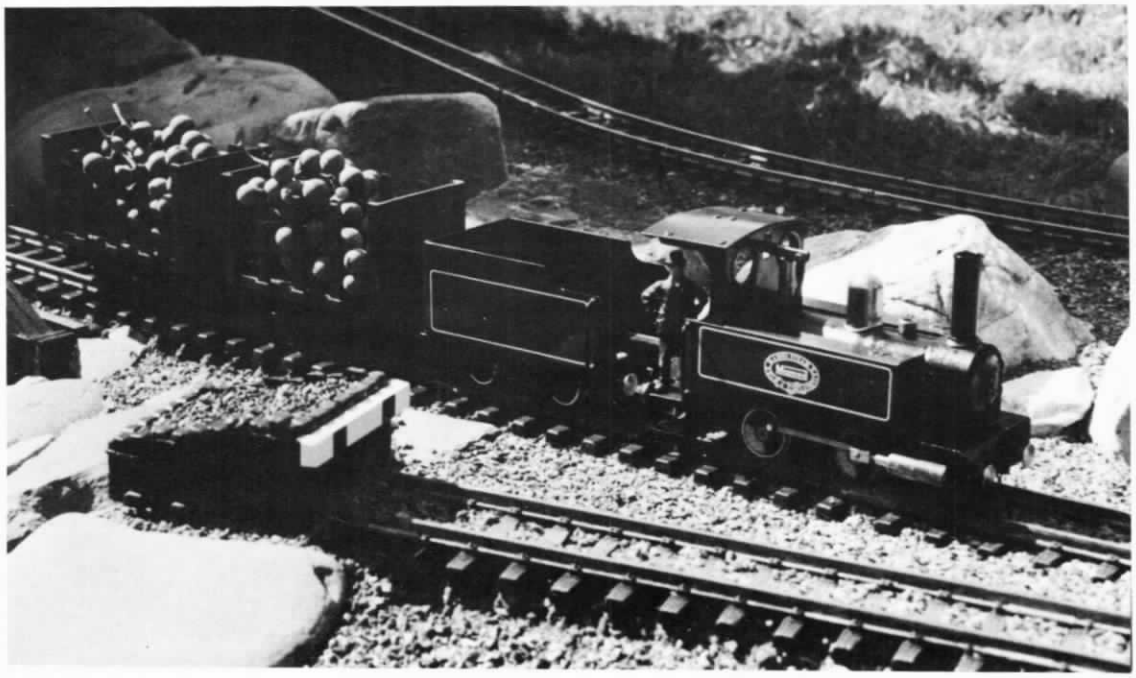


Top Right: A bit large for most of our gardens on 7-1/2" gauged rails, but isn't it a magnificent loco? It would be a perfect subject for a 16mm gauge 0 garden line - and the driver certainly looks the part.

Photos this page by John Wenlock



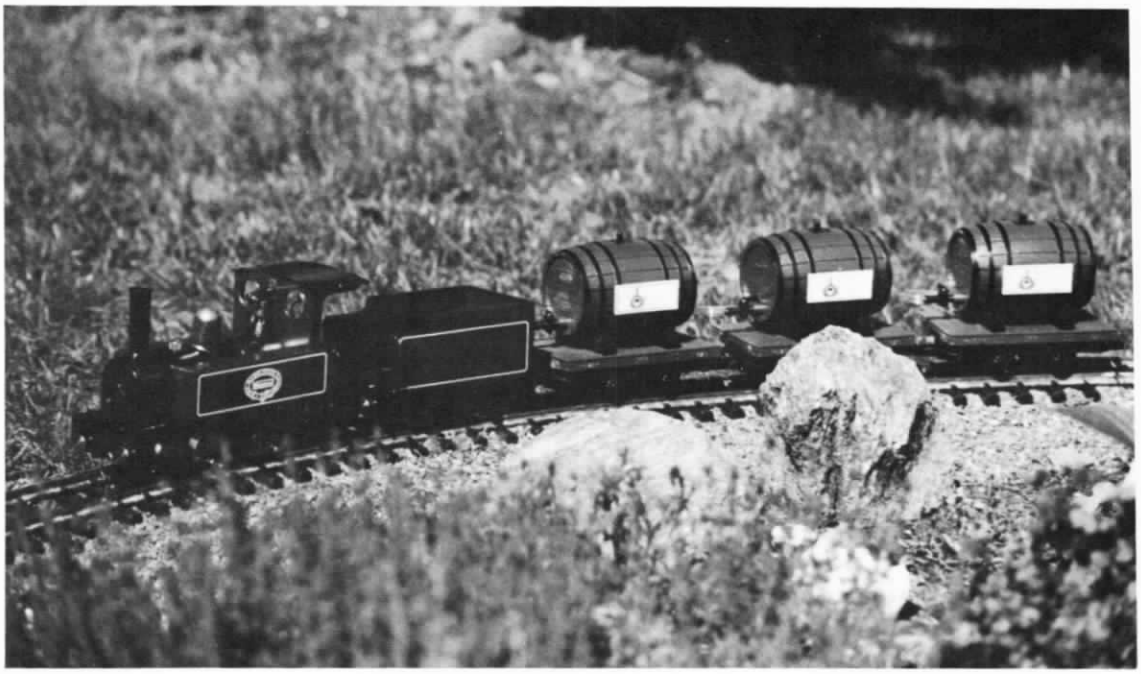
Bottom Right: "The Earl" is even larger at 2' 3" gauge, but is no less magnificent than #1 in the photo above. This is Welsh narrow gauge with all it's charm and attraction. It wouldn't be too tough to modify a Roundhouse Lady Anne, would it?

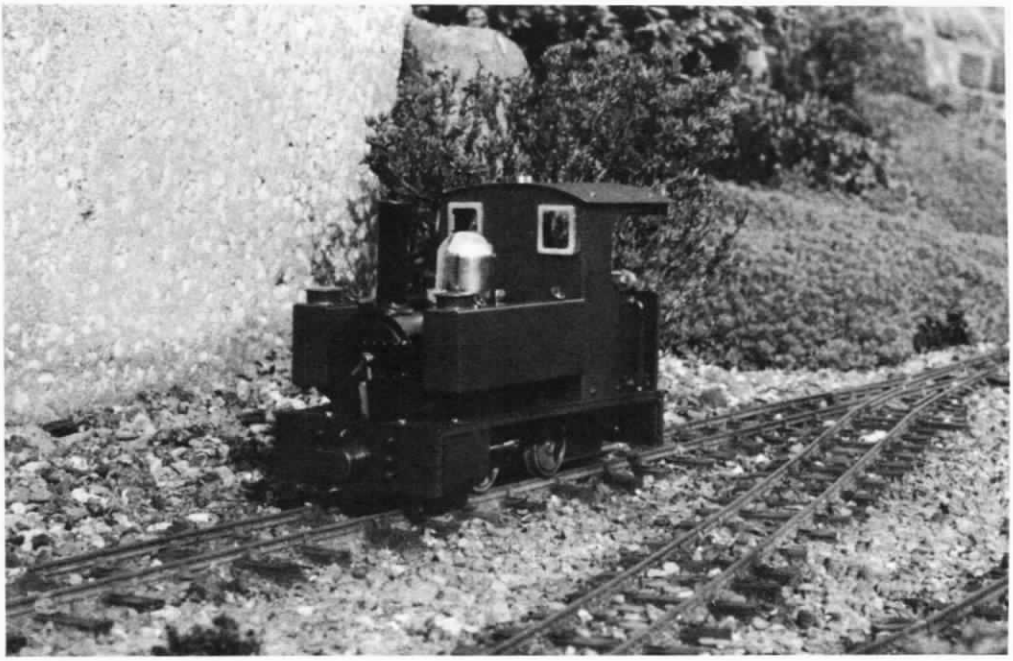


Top Photo: The harvest train departs East Grape behind an MSR-modified Mamod on Frank Ulman's Loyalsock Grampian Beltline in Pennsylvania. The railroad runs several harvest specials a day in season, adding significantly to the revenue.

Bottom Photo: Having dropped its load of grapes at the winery and picked up a load of the finished product, our harvest special rolls out with a load of grape juice and wine for thirsty consumers.

Photos by Frank Ulman





Top & Bottom Photos: One of the newer additions to the motive power roster on the SFSR, this Mamod modification was the result of a collaboration between Deryck Goodall, who handled all the mechanical improvements, and Eric Lloyd, who built a whole new superstructure for it, giving it a totally different personality. Some of the mechanical improvements include: new silver soldered boiler, Goodall meths burner, displacement lubricator in cab, water gauge glass, steam valve (throttle) in cab, Goodall valve (for refilling the boiler while under steam) and the whole Goodall treatment for cylinders, ports and more. Full testing has been held up by lack of a gauge 0 track, but initial runs on our basement test track indicate that it will be a fine performer. A full report on this loco will be included in our upcoming issue on Mamods and other oscillating cylinder locos.

Photos by Eric Lloyd

Ask Dr. Steam

As space, time and the volume of questions permit, Dr. Steam will answer questions and offer solutions to problems sent in by readers. Try to be as specific and as detailed as possible with your questions, and if you just can't wait for the next issue, include a LSASE with your question for a speedy reply. Address all questions for Dr. Steam to: Ask Dr. Steam, c/o Steam in the Garden Magazine, P.O. Box 335, Newark Valley, NY 13811.

Dear Dr. Steam,

I did so well last time with my inquiry regarding the Bassett-Lowke Super Enterprise that here I am again, seeking your help with a Mamod.

Now please don't cringe and shudder! After following suggestions to improve performance that appeared in various magazines (and which I followed to the letter), I still have a problem which is yet to be mentioned. Maybe it only occurs on my machine.

The wheel bushings rotate - not smoothly, but in a jerky manner. I disassembled the entire underside and fitted paper shims (brass wouldn't work). No good - they still rotate.

Leaving everything assembled, I fed in strips of .002" brass shim stock, but after initial success this wretched machine spat them out.

What to do? Are oversize bushings available? Are regular wheels and axles available (not with a press fit that allows a slight wow)?

I await your evaluation and judgement, sir.

All the best,
John Martin
Bellevue, Washington

Dear John,

Your problem with Mamod axle bushings shouldn't be insurmountable. How about using replacement wheelsets (which come mounted on axles and include new bushings) from Miniature Steam Railways? They make a fine looking spoked wheel that I'm presently using on a Kenversions Mamod. The big advantage of these wheelsets over the stock Mamod variety is that they are true running and are attached to the axles much more solidly than the Mamod wheelsets.

A less expensive fix would be to use Loctite to fix the bushings in place. There is a variety of Loctite for every application and they make one for yours. Inquire at a bearing supply house.

Dear Dr. Steam,

First of all, let me tell you how much I enjoy SitG. I discovered it last Spring, and it feels like a breath of fresh air.

Now, a question -- I've got a Mamod #1 stationary engine which I plan to mount on a scratchbuilt chassis using surplus Mamod drivers. I'm envisioning an overtype design with approximately a 10:1 reduction transmission system. Marc Horovitz mentioned using Mamod spring belting in SitG, Vol. 1 No. 6. I see a chain and sprocket transmission on the cover of SitG, Vol. 1 No. 3. Perhaps reduction gearing would work also. Do you know of any sources of metal belting, chain or gearing? North West Short Line and Grandt Line have nice delrin items, but I'm concerned about meltdown. I've got a Brandbright catalog, but it contains none of these items. I'd prefer a domestic source if possible to simplify the ordering process.

Thanks a lot!
Rob Kuhlman
Norristown, Pennsylvania

Dear Rob,

I'm very glad to hear that you're building an OVERTYPE loco, as these engines hold a real fascination for me. Geared engines of any kind are high on my list of fascinating mechanical objects. The chain and gear driven overtype you saw on the cover of SitG #3 is BRIGHAM, which was built by Peter Angus in England. BRIGHAM has a tiny single cylinder engine with slide valve, driving a crankshaft with heavy flywheel (a very important item - it really smooths things out), then through a sprocket and roller chain down to another sprocket and reduction gear train, and finally to the rear driving axle. The rear axle is rod coupled to the front axle. BRIGHAM, despite the miniscule size of its single cylinder, will pull a very respectable train - and will easily handle the most serious upgrades and downgrades without need for intervention on the throttle. It will also run for about 45 minutes on a single filling of the boiler - great economy!

A couple of good domestic sources for miniature metal roller chain, gears and sprockets are:

Serv-O-Link
101 E. Fuller Dr.
Euless, TX 76039
(817) 283-5016

Stock Drive Products
2101 Jericho Turnpike
New Hyde Park, NY
11040
(516) 328- 3300

Both of these companies have excellent catalogs showing their products, along with lots of other useful information.

Dear Dr. Steam,

In the SitG review on the LGB Frank S. you mentioned that if you owned one, the first thing you'd do is replace the gas control valve on the tender. Well, I do own one and I have exactly the problem you reported in the review, and I gather it is a design characteristic of these locos as others have also experienced the same problem. So, my question is.....where does one get a gas control valve suitable for replacing the LGB/Aster part?

Bill Bolton
St. Ives, NSW, Australia

Dear Bill,

I recently spoke to Ron Gibson of LGB America, 6444 Nancy Ridge Dr., San Diego, CA 92121 USA - phone (619) 535-9387 FAX (619) 535-1091. I reminded Ron about the problem described in the SitG review of the LGB Frank S. and told him that several readers had written or called to tell me that they had experienced the same problem. Ron said that he had never seen or heard of this problem, so apparently none of those experiencing problems with their gas valve have informed LGB of this. He also said that he and LGB were anxious to fix the problem. So for Bill - and all you other Frank S. owners out there - your burner control valve should allow you to turn the gas on and off, and it should give you a range of control over the burner to adjust the amount of steam being generated. If you have an LGB Frank S. with a "bad" gas valve (ie. - no range of burner control, or touchy to the point that when the valve is adjusted the fire goes out, or any other burner control valve problem), here's what to do.

First, drain the fuel from the gas tank and any water from the tender, then pack the tender (and only the tender!) extremely well (in the original packing, if possible) to prevent damage, and send it to LGB at the address in the first paragraph of this response. Include a note detailing the problems you are experiencing and mention that you saw this notice in Dr. Steam's column in SitG. Ron Gibson and LGB are both on our "good guy" list for taking such an interest in customer satisfaction! By the way, you might also add a note telling Ron that you'd like to see LGB do another steam loco - and don't be bashful about offering suggestions about which prototype you'd like to see modelled. Hopefully it will be an American narrow gauge locomotive next time!

Above: A visiting passenger train, headed up by an **LGB Frank S.**, crests Garter Snake Grade on Ron & Marie Brown's Silo Falls Scenic Railway.

GEOFFBILT

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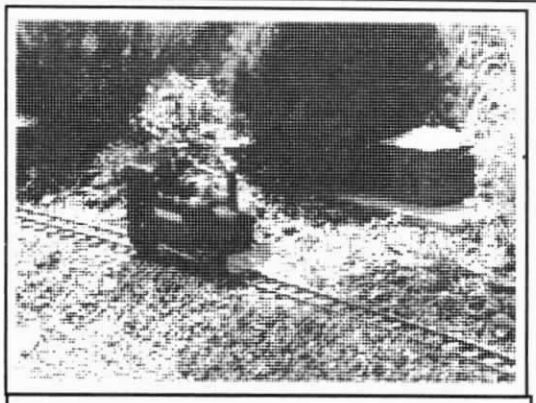
Send $2.00 for our NEW illustrated catalog.

The first batch of steam locos are all sold out and construction is nearly complete, with delivery scheduled for January, 1992. Read the review of our SCORPION live steam locomotive in the October/November issue of SitG, then call or write to reserve yours from our next batch! Take a look at the photo of our busy workbench in the photo section of this issue and notice that we have several different models of live steam and battery powered locos available. Write or call us about building a loco for you - you'll be surprised at how affordable live steam can be.

Geoff Coldrick
Box 277
Salisbury,
New Brunswick EOA 3EO
Canada
Phone (506) 372-4364

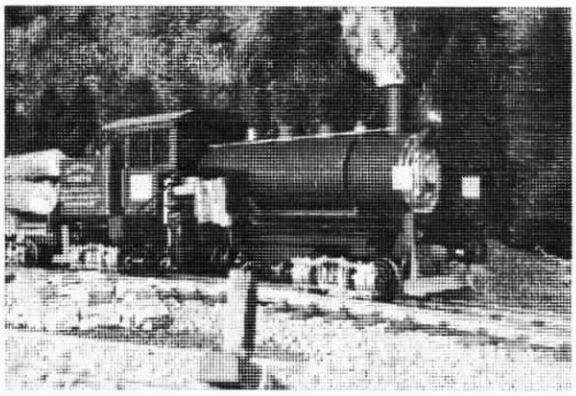


Grasshopper, another fine steaming loco from the GEOFFBILT shops.

Geoff watches over SCORPION as it rolls out onto the steaming bay for a trial run during the SitG steamup last August.

AN AFFORDABLE LIVE STEAM SHAY

- Runs with LGB
- 1:24 Scale, Gauge 1
- Handbuilt of copper, brass & wood
- Each locomotive is test run
- Operating front and rear lights
- Displacement lubricator
- Kadee couplers
- Burns Sturno gel or canned Sterno
- Can be double headed (several radio channels available)



- Insulated drivers prevent shorting if track is powered
- Accessory trip device (© **Jerry Hyde 1988**) can be used to throw track switches, lower motorized water spouts etc. by radio
- Designed to pull several cars similar in number to prototype
- Low pressure boiler with sight glass in cab

INCLUDED

- 1 ga. fuel (approx. 64 runs)
- 16 oz. steam cylinder oil
- 1 lubricator water extractor
- 1 Flashlight
- 1 doz. reed switches
- Radio batteries
- Instructions

$975

SPECIFICATIONS

- Min. radius 2' (LGB 1100 curves)
- Running time approx. 25 minutes
- Copper porcupine boiler 2" X 6", 8 oz.
- Fuel tray 2 oz.
- Lubricator 1/2 oz.
- Overall size 16-1/2" L x 4-1/2" W x 5-1/2" H

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END OF THE LINE

Here we are at the tail end of another issue - and back on schedule with this issue, too! We'll be travelling to California next month and hope to extract some articles and photos from those lucky steam enthusiasts in that land of Endless Summer. Weather reports from California of late indicate that we would be wise to take scuba gear and an inflatable life raft, so we may come back with articles on steamboats, rather than steam engines!

Seriously, we certainly hope that none of our readers in California suffered any damage to their homes, families or railways in the deluge and flooding.

Before we forget to do so, we want to thank John Gordon Jr. for his help in redrawing some of the graphics in this issue. It was too late to include his name in the "credits" on page 3, but he definitely deserves credit for his contributions. So.....thanks, John!

It's time to start making plans to attend the Eighth National Garden Railway Convention, July 5 thru 9, 1992, sponsored by the Washington, Virginia and Maryland Garden Railway Society. For more information, drop a line to the Convention Registrar, 171 Elden Street, Suite 160-217, Herndon, VA 22070 - or call them at 703-471-1442. We attended our first convention last year in Cincinnati, and we had such a great time that we won't miss another if we can help it. This year even our Cheerful and Capable Assistant will be there!

As mentioned in What's New, Peter Martin has taken over sales and service of Maxwell Hemmens products in the USA. Peter tells us that their Porter loco is undergoing a complete revamping, including replacement of brass moving parts that were susceptible to wear. Production of the new version of the Porter is scheduled for July/August 1992. The OGWEN has also been improved and is now in production, with deliveries slated to begin at the end of March, 1992. Improvements to the OGWEN include the addition of a few minor performance adjustments and a tender for carrying R/C equipment. We are impressed with the quality of our Maxwell Hemmens Porter and can hardly wait to see the improved versions of both the Porter and OGWEN. And, of course, to deliver a full report on them to our readers.

See you all in the April issue!

LLAGAS CREEK RAILWAYS

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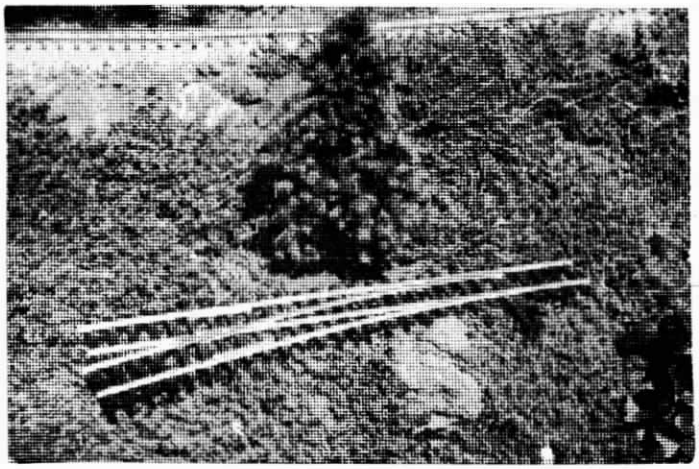
Check the price on our flextrack below.....

Now is the time to make the switch to our code 250 track!

And now you can do it easily with our new complete, ready-to-use turnouts and turnout parts. Cast in nickel silver, with detail that would take hours to reproduce, our castings make building your own turnouts quick and easy. A #6 frog and point sets are available now - and so are our fully built turnouts, made with realistic looking code 250 rail on redwood ties. Allow 4 weeks for turnout delivery - all other items in stock.



Due in March! Code 250 STEEL RAIL, code 250 NICKEL SILVER RAIL and our new tie strip. AND.... be sure to ask about our new *NARROW GAUGE LOOK* TIE STRIP!

Part#	Description	Price Each
2506	Code 250 Aluminum Flextrack - 6' section	$10.50
2501	Cast polypropylene Ties - (use 6 per foot)	.25
RBLT	Complete turnout, left - code 250 rail on redwood ties	60.00
RBRT	Complete turnout, right - code 250 rail on redwood ties	60.00
TF6	Nickel Silver Frog - #6	15.00
PTLR	Nickel Silver Point Set	15.00
SSRJ	Stainless Steel Rail Joiners - 20/pack	7.00
SAMP	Sample of Flextrack - postpaid	1.00

Dealer inquiries invited. For more information write to:

Llagas Creek Railways
2200 Llagas Road
Morgan Hill, CA 95037
or call (408) 779-4391