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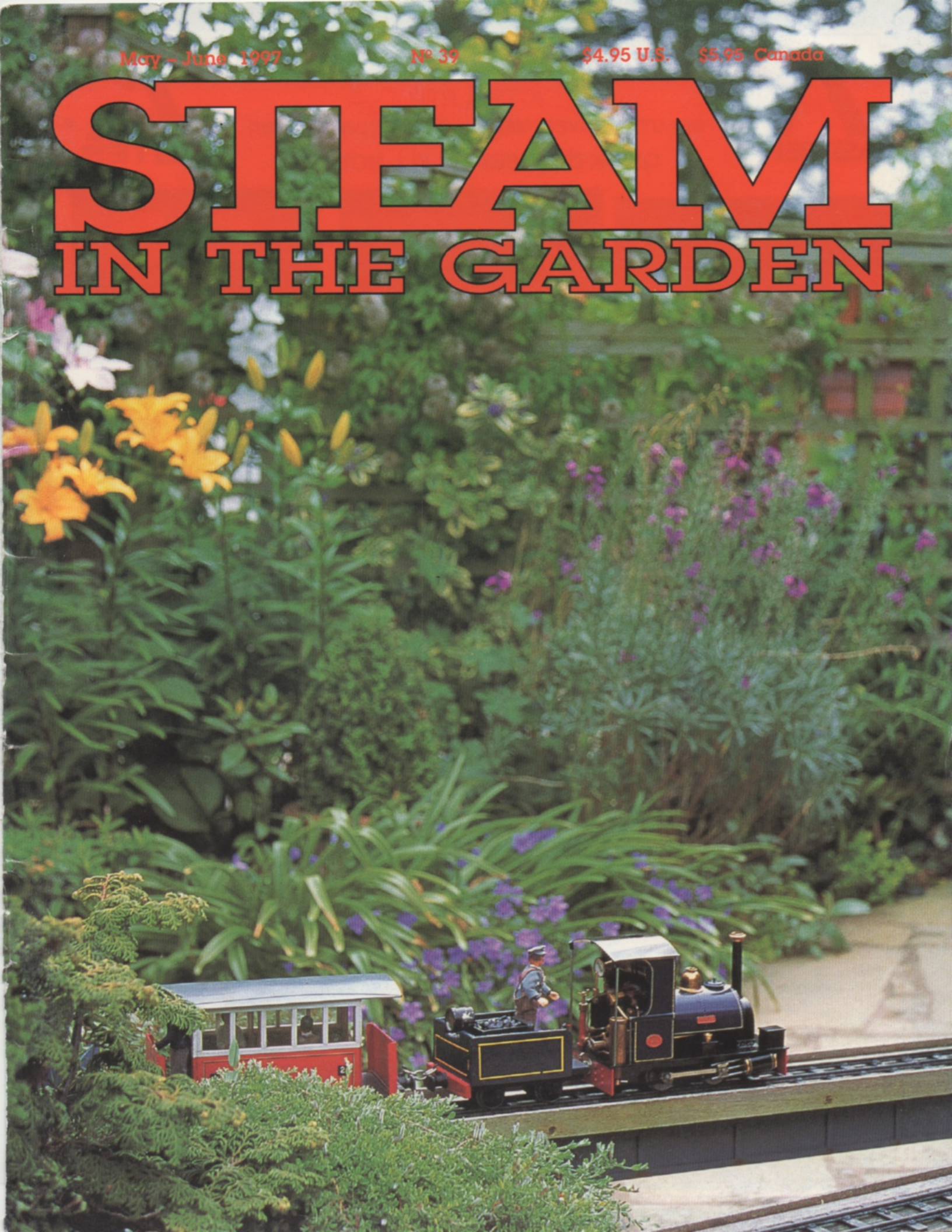

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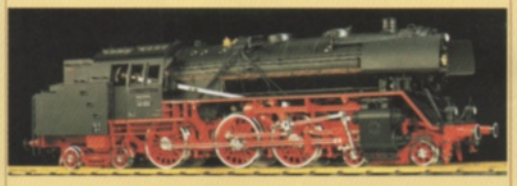

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STEAM IN THE GARDEN

Vol. 7, Nº 3
Issue Nº 39
May/June 1997

Articles

Departments

ON THE COVER:

MENDIP, passenger coaches in tow, saunters easily out of Bumbleberg Station and into the morning sunlight on the daily run to Bumbledorf on Jim and Jenifer Slater's Budley Bumblebahn line in England. The loco is a very fetching Cranmore Pecket from Finescale Engineering, and the tender and coaches are scratchbuilt by Jim Slater. This compact 16mm line was featured in the July/August 1991 *Garden Railways* magazine.

Photo by Jim Slater

Publisher/Editor
Ron Brown

Faithful Assistant & PoGP
Marie Brown

Graphics Director
Harry Wade

CAD (and other) drawings in this issue by:
Harry Wade, Larry Bangham & Joe Leccese

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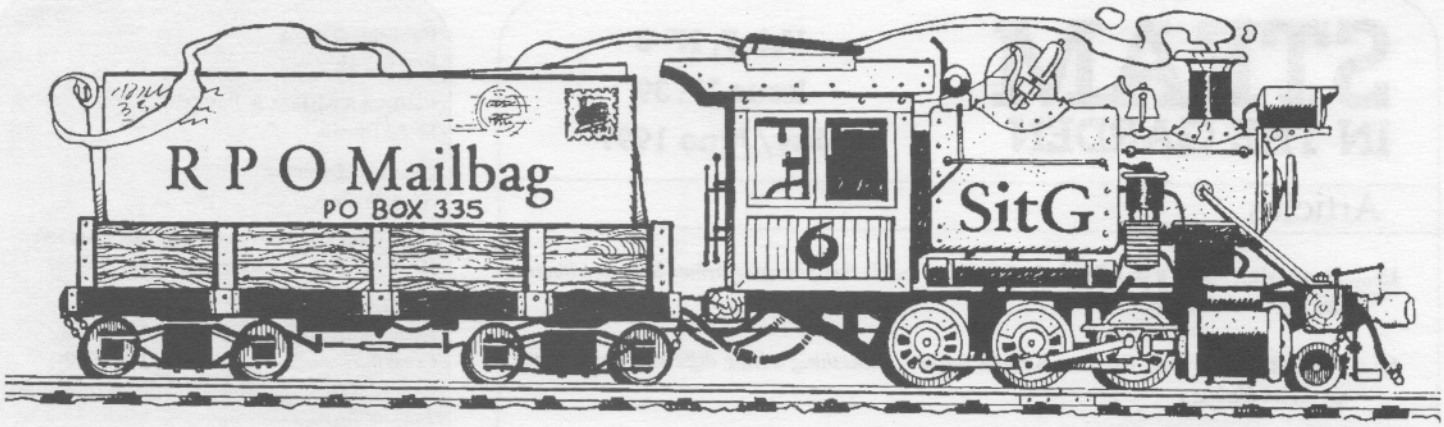

Letters from readers are welcomed and encouraged. Offer advice, encouragement, suggestions or constructive criticism. Tell us about your current project (and don't forget the photos!) or just share live steam experiences. But please keep your letters to a reasonable length so everyone has a chance to use this forum. Some 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.

* * * * * *

via e-mail

Ron,

Thanks very much for the quick mailing of all the available back issues of SitG. What a treasure trove of information on the small scale live steam hobby! Now that I have read each copy two (ok, five times!) I must have the rest of them so I have ordered the remaining back issues from Sulphur Springs.

Just built the Mamod kit locomotive (from reading the magazine it seems like that is required of all true small scale steam folks) and of course discovered all its flaws, so now it's time to start the modifications that I've seen outlined in SitG. Looks like the Sherline tools will be getting a workout.

Thanks again for the quick service and I'm awaiting the next issue.

Best regards,

Mike McCormack
mocrown@aol.com

via e-mail

Hi, Ron!

I enjoy your work with SitG but am not likely to become an amateur machinist, so buying ready-made locos is my intention. I purchased a commercially made engine last year and like it OK, but am a little disappointed in its inconsistent runs. Perhaps that can be attributed to my inexperience and the layout of my track.

When I began in the hobby a couple of years ago I planned a level bent loop with rising terrain between the sides so the trains would disappear and reappear. The track would be level and the terrain would rise and fall. At the time my young teenage son was to be my partner in the layout and we visited open days in our area. At his insistence I redesigned our track plan into a bent figure eight so the train could cross over itself. I tried to be careful with grades. He has now lost interest but Dad still has the desire. I will finish ballasting and wiring for electric running in the very near future (We are hosting an open day in June).

Thanks for listening...perhaps I'll send some photos of my pike, the Shade Gap Railroad, copied after a defunct branch of the EBT. Also, if your readership shows increasing numbers of newcomers like me, a series for beginners on track planning might be in order if oriented specifically toward live steam. Possibly Tag Gorton's series will address issues such as these.

All the best,

Tom Bowdler
bowdler@juno.com

via e-mail

Dear Ron,

Jerry Reshew referred to the convenience of the removable alcohol tank on the JB engine he reviewed, and this is a feature I appreciate in an engine too. It may not be generally realised that most (perhaps all) Aster alcohol tanks may be made similarly removable simply by leaving out the four screws that hold them. Just be sure to close the fuel valve before removing the tank and it can then be refilled away from the engine.

Regards

Murray Wilson
jmwilson@i21.com

Germany - via e-mail

Dear Ron,

In the "RPO Mailbag" on page 6, top right side, issue #38 I saw a letter that I'd like to comment on. Barry French wrote: "... An article on modifying the Frank S. for narrow gauge or early

1900's branchline service on a North American railroad would be much appreciated."

Hi Barry,

Why change the Frank S. to narrow gauge? It is already a narrow gauge locomotive. Its prototype was built for 1000mm (meter) gauge. Like all LGB models it is built in 1:22.5 scale. That means 'G' gauge by American standards or 'IIm' gauge by NEM standards. 'IIm' translates into meter gauge (m) for the standard gauge (II).

I will give you a little more information about the Frank S. and its sister locomotives. The Frank S. was built as a "Heeresfeldbahn" locomotive of the class 'HF 110C'. 'HF' stands for Heeresfeldbahn (Light Army Railway), '110' for the locomotive's power of 110 (DIN)HP and 'C' for the three axle wheelset.

Maybe it's interesting for you that the USTC brought one HF 110 C to America for evaluation purposes. As far as I know it never operated under its own power on American tracks (the next [smaller] gauge it would fit on would be 3 ft.). The only changes to the loco were a big light on the tender and the words "Transportation Corps" and the USTC herald, painted also on the tender.

So why not add more American details (at least a big headlight), repaint the locomotive and freelance a HF 110 C, operating on an American narrow gauge line! I have this idea already for a long time and I strongly support the editor's idea of an article and photos about North American modifications to the Frank S.!

Best Wishes

Thomas Hentschel

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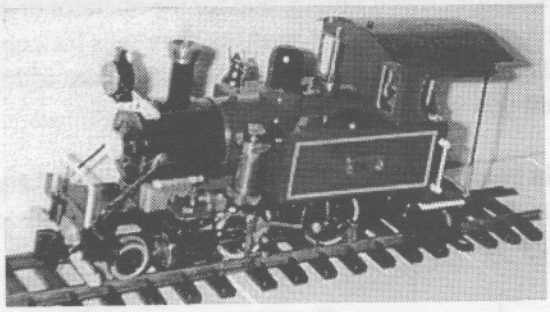

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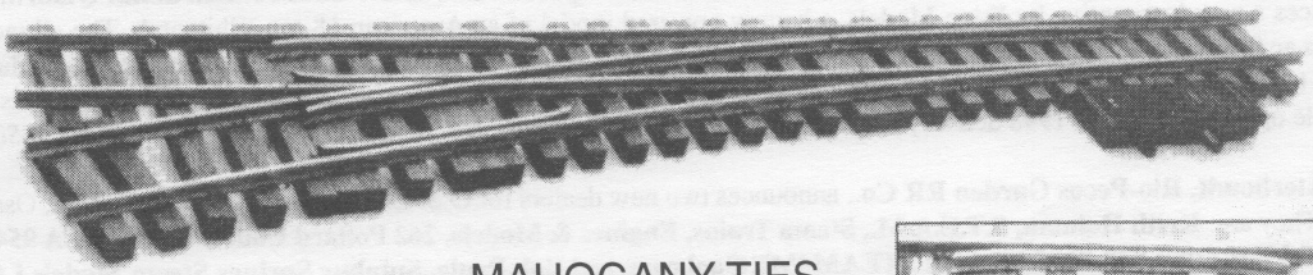

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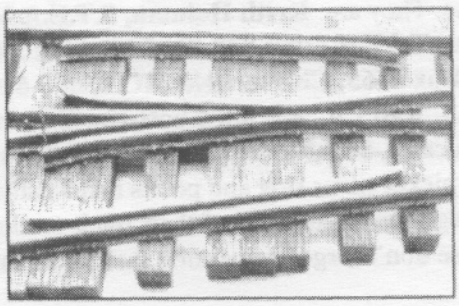

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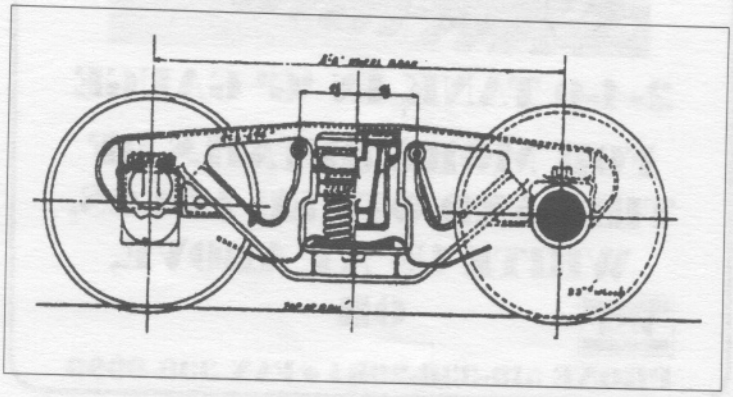
WHAT'S NEW?

H. B. Models, 12 Grove Park, Tring, Herts. HP23 5JL, UK – phone 011-44-1442 823 586, announces that they have been making live steam locomotives and components for scratchbuilders for 26 years. H. B. Models locomotives are of very high quality, and offer much satisfaction for the operator or collector (see the review of their GER 2-4-2T by Jerry Reshew in issue #38). They can also provide working drawings for construction of many models, as well as component parts such as cylinders, valve gear sets and safety valves, which are of high quality and are competitively priced. Please be sure to let Harold know that you saw it in *Steam in the Garden.*

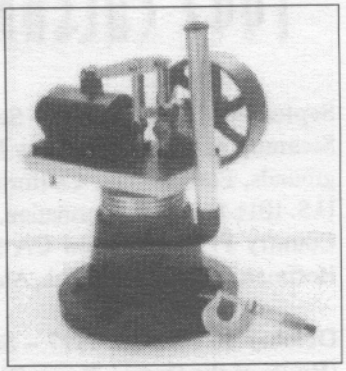
Cambria Iron Company, PO Box 934, Shawnee Mission KS 66201 - phone 800-817-1266, has released a Vulcan Truck in 1:32 scale. CIC's motto is, "Fine Art Quality & Historic Authenticity". They tell us that, "At Cambria Iron Company, we strive to provide realistic, accurate and historically significant models. We hope to provide the realistic modeler with meaningful products that make their modeling projects more enjoyable." Their Vulcan Truck is available in several ways – assembled or in kit form with Cambria Cast Wheels, assembled or in kit form with Gary Raymond Wheels, or in kit form without wheels. Our review sample came assembled with Cambria's own cast wheels on one truck and Gary Raymond we other for comparison. Both are insulated for running with electric trains, and the quality of both types of wheelsets is very good. The truck components are of blackened metal, and they are sprung. The trucks are free-rolling and the quality of all parts is excellent. The floating journal box feature of the Vulcan truck is faithfully reproduced in the model. A nice touch is the excellent documentation and illustrated assembly instructions included with these trucks. We give the Cambrian Iron Company Vulcan Trucks high marks for quality and accuracy, and recommend them without reservation to 1:32 modelers. Soon to be released in the Cambria Iron Company line are Arch Bar Trucks, Brake Kits for Vulcan Trucks and Scenic Details.



Netta Mullin, 1st VP of the Henderson Co. (Kentucky) Historical & Genealogical Society, tells us that the 1901 L & N (Louisville & Nashville) Depot, located in Henderson, Kentucky, is available for sale or trade. Contact Ms. Mullin via e-mail at <netta@hcc-uky.campus.mci.net> for full details.

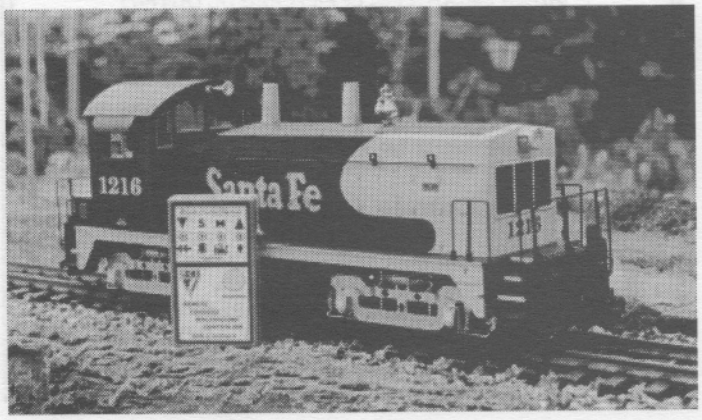
Doubleheader Productions, 3725 Pageant Place, Dallas TX 75244 l phone/fax 972-247-1208 l e-mail dbhdr@iadfw.net announces a new locomotive by Friog Models, a battery powered model of an American 18-ton Whitcomb. The all metal loco has an 0-4-0 wheel arrangement and is built to a scale of 1:20.3 (15mm). It will come standard with dual gauge insulated wheels to run on either gauge 0 or gauge 1 track. The model comes standard with manual speed control, and R/C is an available option. Orders for 1998 delivery may be placed now with Doubleheader. Please let them know you saw it in *SitG.*

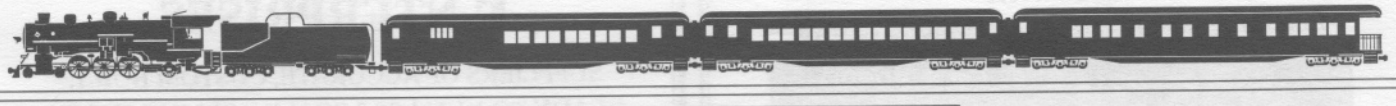
Bob Osterhoudt, Rio-Pecos Garden RR Co., announces two new dealers for O.S. Engines; Locomotive Division, Osaka Japan. They are: **Keith Holman, S.T.E.A.M., Steam Trains, Engines & Models, 262 Pollard Court, Windsor CA 95492 USA l Tel/Fax (707) 838-8135 l e-mail: STEAM4ME@aol.com**, and **Bob Paule, Sulphur Springs Steam Models Ltd., PO Box 6165, Chesterfield MO 63006-6165 USA l Tel/Fax (314) 527-8326 l e-mail: SSSMODELS@aol.com.**
P.H.S. Rail Co., RR #3, Chatham, Ontario N7M 5J3 CANADA – Tel./Fax: (519) 436-1201 or (519) 439-9246 (in the USA call 1-800-443-0440), announces the availability of switches in code 250 and code 332. These switches feature wooden ties, nickel silver frog and points and weathered rail. Write or call for more information, or send $2.00 or a LSASE with 52¢ postage for a catalogue of their track products and sample of their rail and tie strips. P.H.S. Rail also accepts credit cards. Please don't forget to mention that *SitG* sent you.



Miniature Machinery, 120 Cliffside Road, Wimberley TX 78676 is offering a Robinson-type hot air engine in factory built or unmachined kit form. Around the turn of the century, the hot air engine was produced by a number of different makers. A. E. & H. Robinson, of Manchester, made engines in various sizes, the largest having a 10" diameter cylinder and the smallest having a 4.1/2" diameter cylinder. This engine is a model of Robinson's smallest, and it has a 2" bore, 1.3/4" stroke and a 5.1/4" flywheel. The model is propane fired. Be the first on your block to build a hot air powered locomotive! Write to Kenneth Rhodes of Miniature Machinery for more information, or to place your order. Please tell him that you saw it in *Steam in the Garden.*

Remote Control Systems, PO Box 1118, Bayswater, Victoria, 3153 Australia - Phone/Fax International(61-3) 97 62 77 85. Available in the USA from Northwest RCS, 8026 NE 124th St, Kirkland WA 98034 - Tel/Fax 206-823-3507. Remote Control Systems has a new, multi function radio control throttle system ready for immediate release. RCS believes that this is the first R/C system designed specifically for the USA Trains® NW-2 Diesel. RCS is offering the locomotive ready to run with a choice of liveries, or as a DIY installation kit for previously purchased locos. The system can be powered by a constant voltage on the track or with self contained rechargeable batteries, or both. A fixed traction voltage enables constant lighting, improved smoke and engine idle sound when standing still. The RCS 8-function digital FM R/C transmitter will fit in a shirt pocket. Six frequencies and selectable side channels will permit 18 operators to control their locos simultaneously. An MU capability is standard for up to 3 locos. The RCS "NW-2-R/C" is offered with or without Dallee® EMD sound. Extra functions are provided for sound system triggers, engine rev-up and uncoupling. A kit to unitize the "calf" is also available. Contact RCS or Northwest RCS for more info or to place your order. Please let them know where you read about it.





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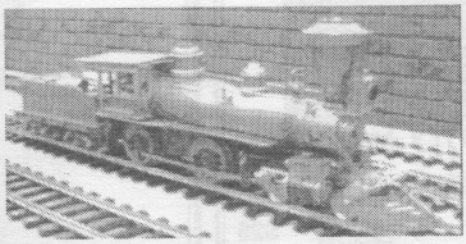

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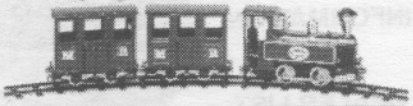

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1997 CALENDAR OF EVENTS

September 13 & 14, 1997 – Second Annual West Coast Gauge 1 Steamup & Garden Railway Meet. San Luis Obispo County Fairgrounds, Paso Robles, California (Halfway between LA & SF on U.S. 101). For more information, contact James Fitzgerald, 1150 Wine Country Pl., Templeton CA 93465 (805-434-5058) or Arnold Hoffman, 2970 Ramona Rd., Atascadero CA 93422 (805-466-2398).

October 10 thru 13, 1997 – Sacramento & Southside Railroad (Route of the Roses). Kevin O'Connor is hosting an open house on his new elevated live steam track. Gauge 1 – 12' minimum radius – just a few blocks from the California State Railroad Musem in Sacramento! Please write or call for directions. Kevin O'Connor, PO Box 161631, Sacramento CA 95816-1631. Phone/fax 916-447-5433.

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.)

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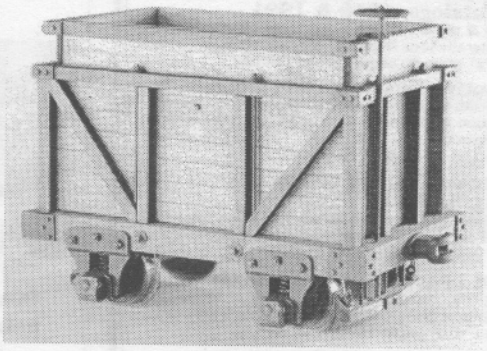

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The Fitter's Bench

by Crankpin

Milling About

Now, as I promised, I will for the next two or three issues take up the last of the machine tools that will get the treatment during this series, the milling machine. Of the three basic machines which are found in the model engineer's workshop (the drill press, the lathe, and the miller), the milling machine is traditionally the last of the three to be acquired. It has until recently been the prevailing perception that the lathe is far more useful than the mill and therefore should be higher on the amateur's need-to-have scale. Although this is actually quite true, this lathe-first attitude is changing, however, and I have noticed that when contemplating the equipping of a workshop, a growing number of prospective buyers are thinking, when finances permit, in terms of a lathe and miller, rather than of a lathe alone.

In recent years, after beginning to keep an inventory of what percentage of time I spent working at my own machines, I was interested to see the amount of time spent on the milling machine had increased to the point where it regularly equals or exceeds the time spent on the lathe. In my shop the two machines have become equally useful and I wonder how I got along without a mill, although I did so for many years, either by use of the lathe milling attachment or by begging the occasional use of friend's machines.

Just in case you missed the last episode, perhaps I should once again run briefly through the basic terminology that applies to any "milling" setup. A milling machine which is capable of the normal range of movements will have three cutting planes or "axes", the X, Y, and Z. In a conventional milling machine the X-axis refers to movements made along the longitudinal direction of table travel, from right to left and left to right as you face the machine. The Y-axis then is perpendicular to the X-axis and refers to movements made across the X-axis. In the conventional milling setup, both the X and Y axes are in the horizontal plane. The Z-axis is perpendicular to both the X and Y axis and is in the vertical plane.

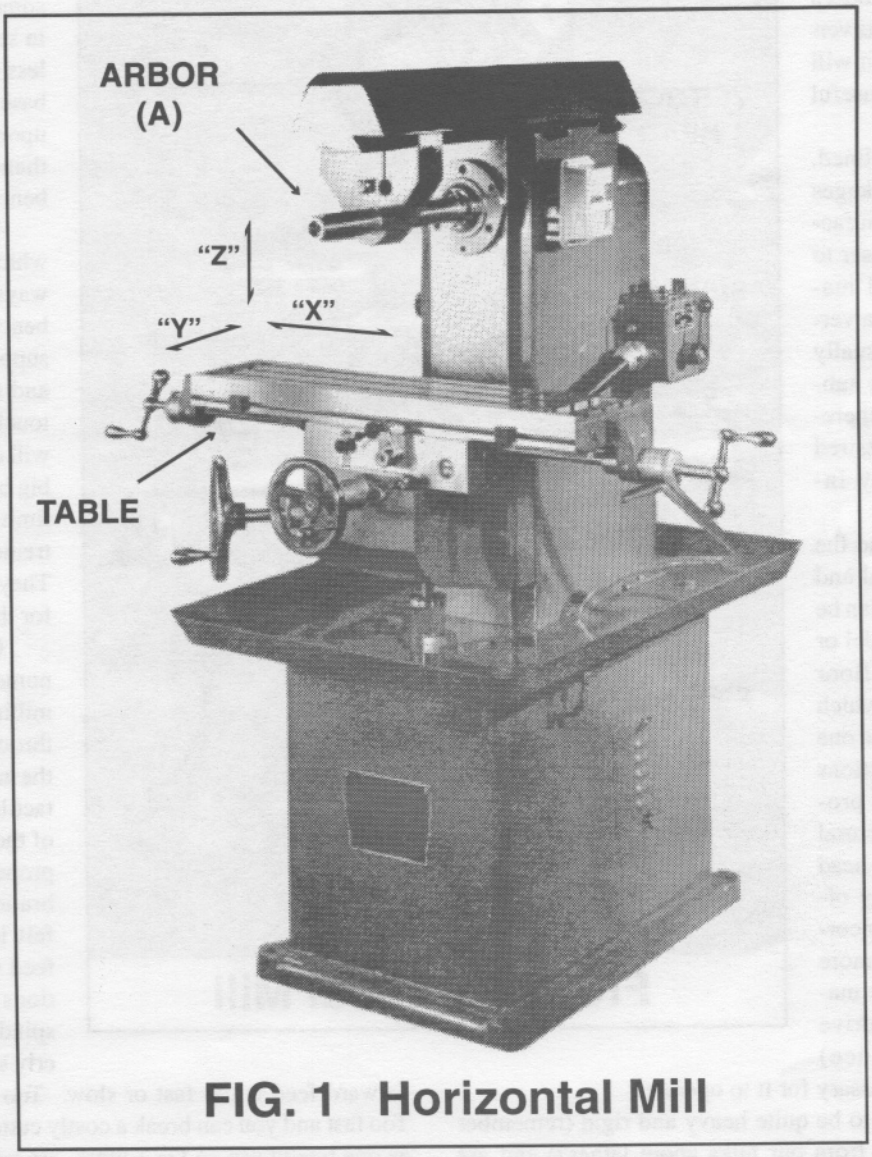


FIG. 1 Horizontal Mill

In the milling machine the X and Y axis travel is a function of the milling table assembly and is normally accomplished using feed screws to move the table about in increments of 0.001" or .05mm. The Z axis travel is accomplished by one of two methods, by raising or lowering the "knee", again using feed screws, or by a feedscrew controlled downfeed of the "quill", the movable part of the milling head which holds the cutter spindle and spindle bearings.

The X-Y feeds are used to provide traversing, or positioning movement in which the work holding components are moved to a position where the cutting is to take place. The Z movement, on the other hand, provides for the depth of cut. Now that we've got that out of the way, let's move on to a description of the various types of milling machines.

There are two principal types of milling machines commonly manufactured today, the horizontal (Fig. 1) and the vertical (Fig. 2). In the horizontal milling machine the removable spindle (a) which carries the cutting tool is called the arbor and lays in the horizontal plane, parallel to the table surface and along the Y-axis. The horizontal is the oldest mill design and in many of the older, established commercial machine shops you will find that it continues to hold a valued place amongst the newer mills. The spindle of the vertical mill (b) is, as you may well guess, in the vertical plane (Z-axis) and is perpendicular to the table. The vertical mill has become the machine of choice for the modern machine shop because of its versatility, and for our work it will be found to be the most useful of the two types.

If the owner is so inclined, there are conversion packages available from many manufacturers which enable the user to reconfigure a horizontal machine into a vertical, and a vertical into a horizontal. Usually these accessories are very substantially made (and are therefore expensive), and if desired can be left permanently installed.

Just as is the lathe and the drill press, both horizontal and vertical milling machines can be made in either a floor model or bench model. The true floor model machine is one in which the base and body are cast in one piece, or at most two sections joined permanently, and provides a rather massive structural base on which to mount the head and table assemblies. Very often the floor model has incorporated into its base one or more of the mechanisms of the machine, such as the motor drive or the Z axis (or knee) feedscrew, which are necessary for it to operate.

These machines tend to be quite heavy and rigid (remember how important rigidity is from our talks about lathes?) and are mostly found in commercial shops, although they are now found in increasing numbers in the home shop. These machines have table sizes beginning at about 7" or 8" by 32" and upwards, with the most common size being 9" by 42", that of the "Bridgeport" type mill. Very large indeed, and very expensive!

These machines will, however, tend to be simply too large for Gauge 1 or small scale live steam work. Although I will admit that it seems unlikely when it comes to machine tools that anything could be too large to be of use, but in the case of Gauge 1 work this is so. I will explain why in just a moment.

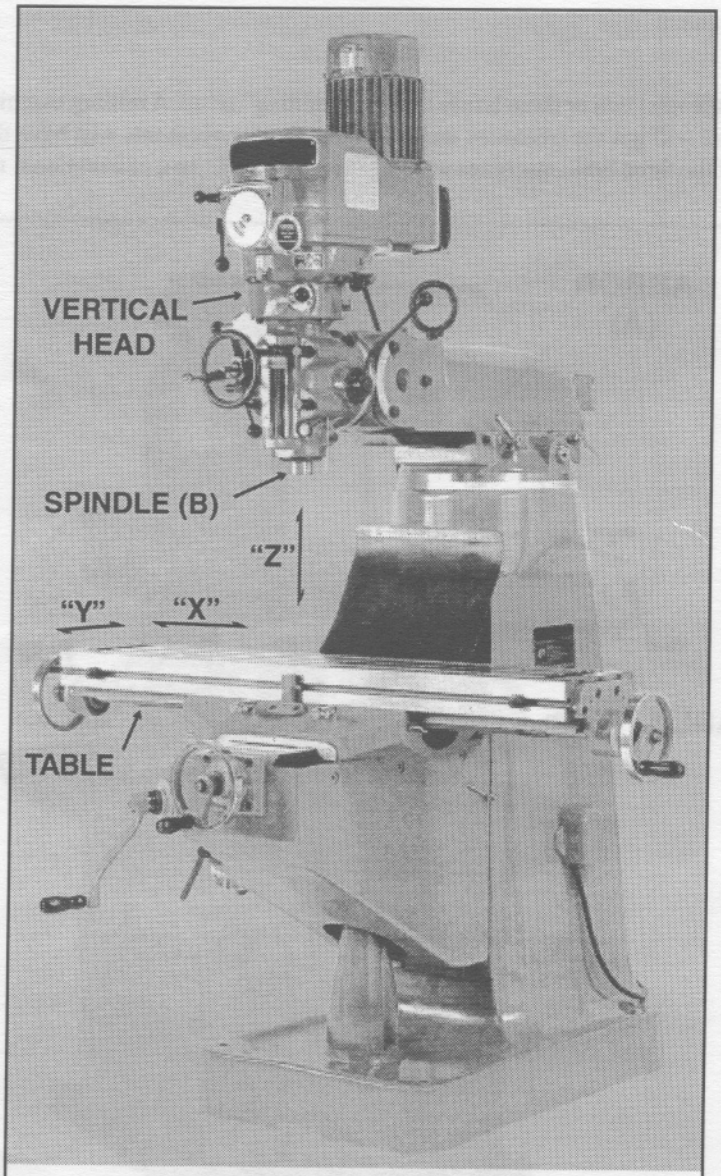


FIG. 2 Vertical Mill

One of the determining factors in classifying a mill as a bench mill is that it is usually designed to be self-contained and does not rely on the bench or stand to provide any operational feature of the machine. As can be imagined, the bench mill tends to be relatively small and light with even the larger ones weighing in at only a few hundredweight, and the smallest at less than a hundredweight all up. Many manufacturers of the larger bench model machines offer a stand or base of some sort, heavy cast iron ones in several instances, but regardless of the size or weight of the base, if the machine does not rely upon the base for anything other than just a place to sit, it is a bench machine.

The very small machines, which include the mini-mills, always simply rely on the workbench or small table to provide a support. The smaller bench mill, and the mini-mills which I will touch upon in more detail later, will do the same tasks as all their big brothers, but because of their limited size and rigidity are extremely limited in their capacity. They are, however, just the ticket for the small scale live steamer.

One very important phenomenon of milling is that the milling cutter, as it makes its way through the workpiece, will give the machinist both audible and tactile feedback on the progress of the cut. When the machine is properly matched to the job, vibrations and resistance can be felt in the fingers holding the feed wheels. From these sensations one can tell whether the spindle and cutter speed is properly set and whether your rate of forward feed is too fast or slow. Too slow and you waste time. Too fast and you can break a costly cutter. Very small cutters, such as one would use on Ga 1 work, are very susceptible to breakage and the slightest overstressing will snap one without warning.

Due to its smaller mass, the small milling machine will produce much more feedback at the handles and will allow you to monitor very closely the progress and condition of your cut. On the other hand, the very large mass and internal frictional resistance of the large milling machines will absorb all of the vibrations produced by a very small cutter and will give you no feed-

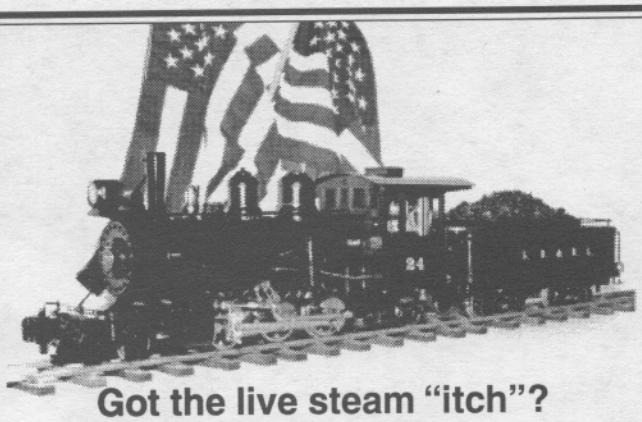
back whatsoever as to how the cut is going. Many small but expensive cutters are broken in the larger machines, so be warned.

Millers are made in many models, sizes, and forms and like the lathe, they are identified by the theoretical size of the workpiece which a particular machine will hold. I say theoretical because as you will remember, a lathe of say 5" center height and 19" center length will not hold a cylinder 10" diameter and 19" long as its size designation suggests, unless the carriage is removed.

The primary identifying specification of the mill is the size of the milling table which ranges in size from 2" x 12" up to several feet in each direction. The first dimension is always the table size in the Y-axis direction and the second is the table size in the X-axis. Unlike the lathe, however, the milling machine cannot always be identified solely by the work capacity, and several other pieces of information are needed to fully describe a given machine.

I will describe some of those capacities as we move on in our next episode, but for now, in the interest of being a good contributor, I am going to have to break off this episode at this point, otherwise our good editor is going to change his mind about giving me this space and begin charging me for it!

Next issue I will pick up again right where I left off and continue the lesson on the mill and begin a description of the basic accessories. Cheers until then.



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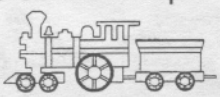

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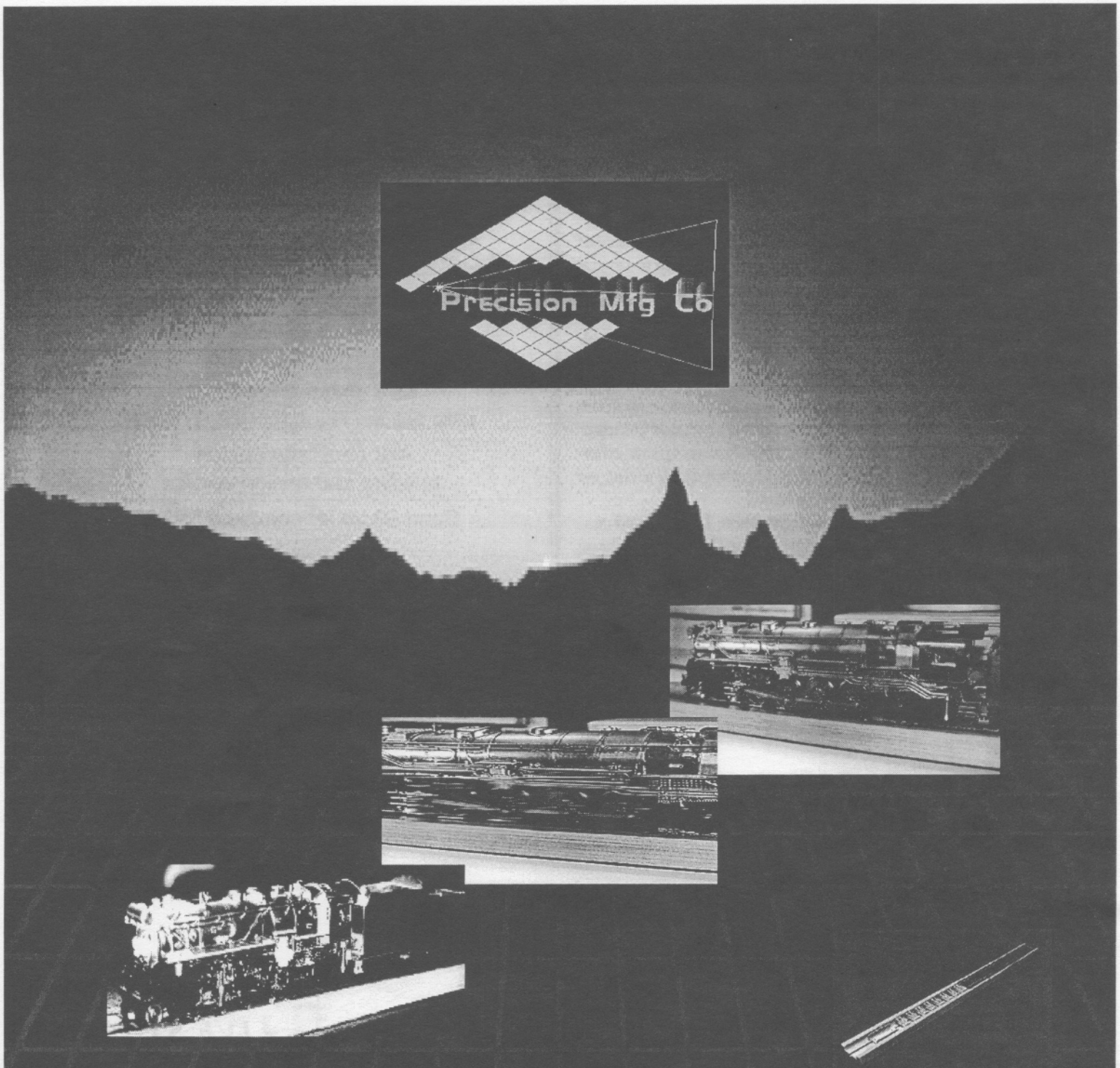

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Improving Aster's B-1 Baldwin 0-4-2T

by Kevin O'Connor
drawing by Larry Bangham

Turning this delightful little loco into a furious steamer – the easy way

In 1980 the Aster Hobby Company of Yokohama Japan introduced their live steam model of a Baldwin Locomotive Company plantation style locomotive. It is a very nice, simple, high quality rendering, having proportions that please the eye. There were a fair number of these little locomotives built in either of two variations. One version, done up in all black, represented American practice as used in the pine forests of the Atlantic South, while the light green boiler of the "Russian Iron" variant represented Japanese logging practice.

I had wondered why I had never seen one of these beauties in the flesh, so to speak, at any of the left coast steamups that I had attended, but never asked the question. At Diamondhead '96 I saw one of the B-1's in action at the hand of my friend Gary White, who used to be the US mainland representative for Aster. I noticed that he was operating at warp speed and I inquired as to why. He told me that the B-1 did not have a good reputation as a runner since it was almost impossible to hold a fire on all wicks at the same time. The forward wick was the worst actor of all. Gary further related that the way that he got his B-1 to operate was to plug up the forward flue upcomer, disable the attendant burner cup, lengthen the remaining three wicks, and to "run as fast as hell" to keep the flue drafting. I saw it, it worked, but the high speed approach was not to my liking.

To my mind, if you are going to model in one scale or other what is the point of mechanical accuracy if you don't enforce operating accuracy? Anyone who has seen the commercial videos which highlight the Yokohama live steam club's operating meetings knows just what I mean about nonprototypical operation. The members seem to operate all their locomotives in the fast forward mode all the time. I vividly remember one scene in which a beautifully done up Aster Alisan Shay rockets by the viewer with all its valve gear threatening to lurch into space, and looking for all the world like a giant Philippine cockroach scurrying to the next flat rock under which to hide. What I wanted to get to was a B-1 that would run slowly and pull four or five four wheel cars at scale speeds.

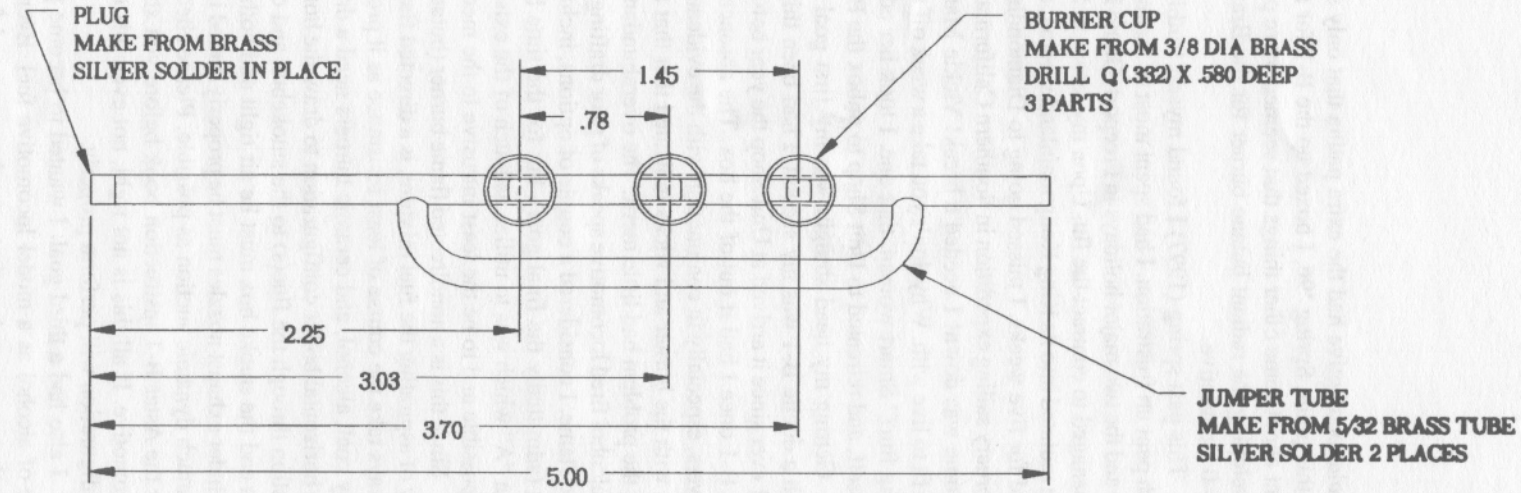
A few months after seeing Gary's B-1 in action I was able to purchase a used Russian Iron version from offshore. It was in relatively good condition, all things considered, but it was missing its headlight. Mr. Inoue of Aster was able to supply me with a replacement part and I was grateful for his help. I noticed that the locomotive had been steamed many times, but that there was almost no wheel wear. I also noted that someone had soldered larger diameter brass tubing around the copper wick holders in an attempt to increase the wick diameter. The existing wicks, made from an outlawed substance, were very loose in the burner cups, and the whole locomotive had the extra patina that only soot can impart. At this point, Spring '96, I boxed up the B-1 for another day and went about some other things that seemed more pressing, such as developing the radiant butane burner for the Brandbright "Jane" 0-4-0 locomotive.

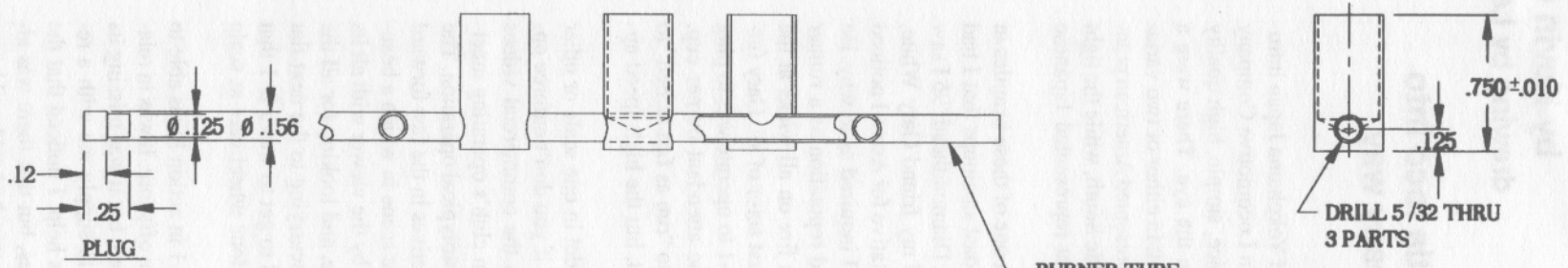
This past spring (1997) I found myself frothing at the mouth with pent up frustration. I had spent most of the month of December and the two major holidays in Freeport, Grand Bahamas, where I managed to contract the flu. Upon my return to Sacramento, the bug mutated into its King Kong mainland version, and I went down hard for five weeks. I missed going to Diamondhead '97 and my February sailing expedition in Southern California. Costs were up! Income was down! I needed a break! Vickie Marie said "You're not fit to live with. Why don't you take a week off and go do something fun?" Smart woman, that one. I took her advice, a week to myself, and retreated to Unit Shop to unbox the B-1.

Getting my head straight was my first goal and coming up with a docile B-1 was my second. I had been thinking about the B-1 ever since it arrived at Unit Shop the year before. I reanalyzed the B-1 once I had it out of the box. The absence of wear on the drivers, especially in conjunction with the evidence of much fooling with the burner and wicks indicated that that approach to fixing the problem had little merit. The overabundance of soot in/on an alcohol fired locomotive speaks of poor drafting and/or a smothered flame. I considered a couple of options, including butane firing (admittedly the final goal), but for the time being set out on plan "A" which was to utilize as much of the existing locomotive as possible and to be the least intrusive to the mechanism.

Since this is a nondirected flame burner (butane, by the necessity of aspirating the fuel mixture, is a directed flame) the fire will always take the course of least resistance as it propagates. This is why coal, alcohol, and ceramic burners need a drafting source in the horizontal boiler configuration to draw the hot gasses of combustion through the flue(s) to the smokebox and out the stack. To this end the smoke box must be air tight and both the blower and cylinder exhaust nozzles must be properly aimed in order to create as much dynamic suction as possible. Please check all this out as per the Aster B-1 instruction book before you start to steam the locomotive. If all this is not right, not even this optimum burner configuration will perform properly.

I also had a third goal; I wanted to become proficient in the use of alcohol as a model locomotive fuel. Even though I am a fourth generation American, my long ago and far away heritage shudders at the thought of burning a substance that more appropriately should be consumed in the company of others; it has no quibble with butane nor coal as a proper fuel. Former steaming





NOTE: CROSS DRILL 5/32 HOLE IN BURNER CUPS FIRST

BURNER ASSEMBLY- BALDWIN 0-4-2T

Indiana Railroad Baldwin 0-4-2T

buddy Maelor Davies had started me on the road to alcohol (my ex drove me to drink), and between them I had some rudimentary information with which to start. Mike O'Rourke (who tries to keep me humble) early on lent me some photocopied articles written by Richard Loxley many years ago in the English model press about alcohol firing and the concept of the wick as a valve. Armed with this information I dug into the challenge at hand; the B-1.

I was successful. Plan A worked the first time, and here is what I did. I deduced that Gary was onto something with his idea to plug the forward flue upcomer and to increase the available draft to the remaining three upcomers by overspeeding the locomotive. I reasoned that if I plugged up the forward upcomer and increased the diameter of the remaining wick cups that I would be able to supply sufficient heat to the boiler to sustain low speed operation without the need to "crack" the blower valve.

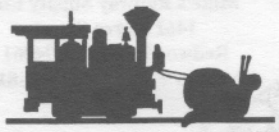
Please look at the drawing that my friend Larry Bangham made of the replacement burner. It is a direct drop-in for the Aster burner, no cutting or fitting required. It is made from brass tube and round stock silver soldered together. Not shown is a brass plug that needs to be turned and gently push-fitted into the forward upcomer tube, which will block it off. This plug prevents cool air from being sucked up into the flue, and it also improves the draft of the remaining three upcomers. The jumper line provides adequate alcohol fuel to the forward wick and the middle wick is supplied by both the jumper and the center line. If any wick starves it will be the center. The wicks need to be packed medium tight to tight, with the looser one in the middle. If you pack the wicks too loose the safety will be constantly lifting, and as you know from my previous articles that is something that I think should be avoided.

It is interesting that a locomotive that had the reputation of being a poor steamer now will produce so much steam that alcohol metering becomes a critical operating factor.

Next issue we will get into the proper operation of the B-1 in much the same way as we did in the previous Frank S. series. I will cover wick packing, shape, and fine tuning as well as modifying the chicken feed alcohol fuel hopper so that it works without "burping" and gives a continuous 30 minute flow of 60cc of alcohol without having to unsolder anything. This information is directly transferable to any other alcohol fired locomotive. I hope that it will have the effect of relieving the strata of bad smells that waft up from the operating areas at indoor steamups, which are caused by improperly packed and trimmed wicks.

If there is enough interest in obtaining manufactured copies of this burner design, including the upcomer plug and the not yet highlighted trumpet horn modification to the chicken feed alcohol feeder vent line, as a kit of parts to upgrade existing B-1's, it might be possible that Unit Shop would produce a onetime limited number of retrofit kits. If you're interested, contact Ron Brown at the SitG office and we'll see what can be done.

By the way, Vickie Marie was right. The B-1 took my mind off all my frustrations and I was once again the captain of my destiny; on course, on budget, and on line.



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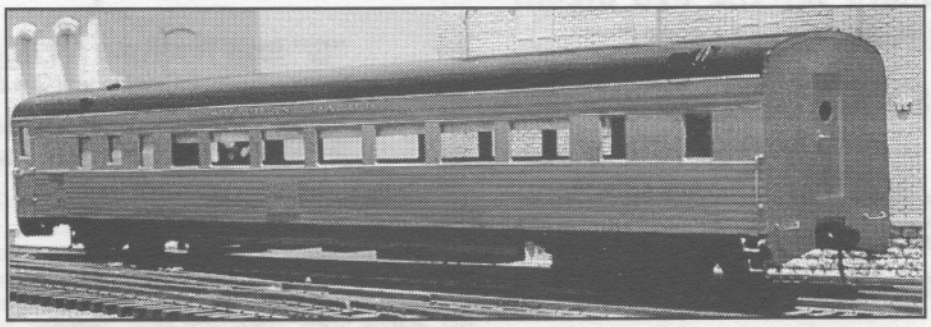

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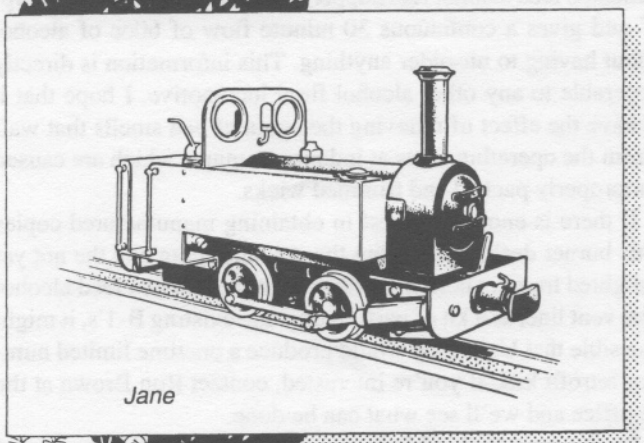

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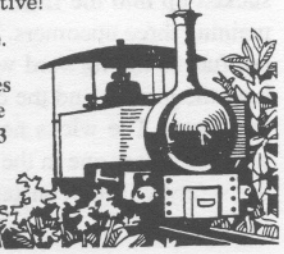

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Notes From The Backyard

by Rich Chiodo

Of scales & gauges & stoking the fire...

Narrow gauge railroads have a charm which is hard to resist. Many of us small scale live steamers, whether we realize it or not, operate models of narrow gauge prototypes, be they from Wales, England, Ireland, Germany, USA, etc. These are the most often seen 0-4-0, 0-6-0 and other short wheelbase tank engines, and differ from those operated by the Gauge One folks with 1:32 scale models of standard gauge mainline steam, which also have large and loyal followings in the UK, the Continent, Japan and here. Aster has done a marvelous job of supplying examples to this scale and gauge, as have numerous firms from the UK and elsewhere.

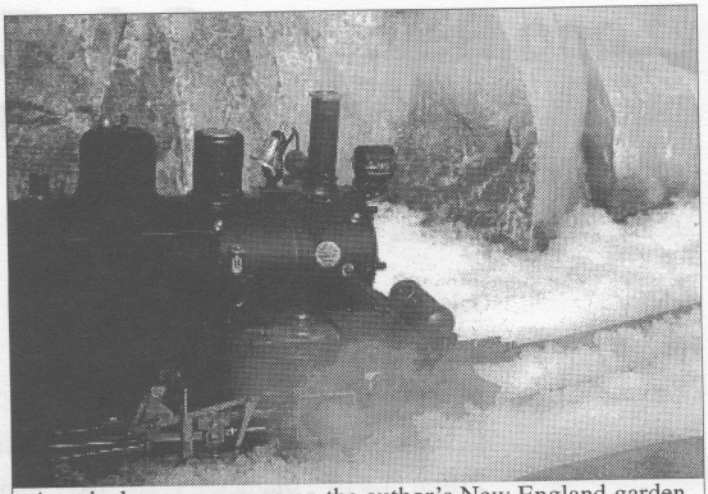
Tracing the development of garden railroading and small scale live steam in the States, you find a dominance of Gauge One or 45mm, with narrow gauge equipment having its genesis in LGB and early imports of live steam from Merlin, Archangel, Beck and Mamod as well as scratch builders from the larger scales and gauges. Thus, early on we innocently settled on a gauge and scale "standard" which had no roots here, since 45mm gauge track in the popular 1:24 and 1:22.5 scales is incorrect rail spacing for those scales.

Why is this important and why waste valuable space fussing over the scale of the trains we run on our railroads? Well, it really doesn't matter as long as you are having fun and enjoying the hobby for many of its other benefits. But, over the long run, if you stick with it, the importance of scale and true to prototype practice begin to hold sway. The charm of just running trains may not be enough any more. Questions asked by visitors may lead to finding out what prototype your engine was modelled after, its builder, the railroad it ran on and other facts that fix the model to some historical root. Thus armed with some knowledge the thirst for more may fuel the desire to replicate – to the extent possible – prototypical practice.

Now, this does not mean becoming a walking encyclopedia for the East Winnoocki & Foaming Creek RR. Even I walk away after 10 minutes listening to those who have gone over edge. It may mean that at the least you would want the scale size of your engine and the distance between the rails it operates on to represent that which accurately depicts some prototype. When your golfing buddy asks, "What's that?", you can reply, "That's a model of a Portland Forney, which operated over the Wiscassett, Waterville & Farmington RR around 1914." Sounds a whole lot better than, "That's a train I'm playing with."

Let me review two examples of Narrow Gauge prototypes/modeling focus which have a following that take the above discussion very seriously. Enough so that clubs, literature, conventions, suppliers, etc. have grown to support the effort.

In the UK, the several Welsh 2-foot gauge lines have a long history and rabid following. Those who model these prototypes in large scale have chosen 16mm to the foot. Now bear with me, 16mm to the foot is equal to a scale of 1:19, more or less. If you use 0 (32mm) Gauge track, this works out to be a gauge of 24 inches for the prototype, Voila! All you serious modelers can yawn now.



A typical summer scene on the author's New England garden railway. ***Photo by Rich Chiodo***

Thus, many of our UK friends (and some of US) are 32 millers or 16 millers or model the 2-footers in 1:19. See? Easy. These models have that chunky, evocative charm of Narrow Gauge and, once bitten by the bug, it becomes a lifelong affliction. Many live steam and battery op models of these 2-foot prototypes are available, as is much in the way of rolling stock. See the advertisements in this magazine and others which cater to the large scale hobby. Track work is similarly available from many suppliers.

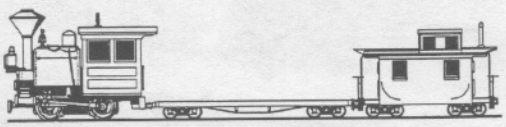
As a garden line, 0 gauge track presents some interesting benefits, and when combined with 1:19 scale trains and buildings makes, perhaps, the best combination of look and feel of a little used, quaint branch line. Curves can be tighter and, in general, the space needed is a bit less than Gauge One.

My friend, Wayne Slaughter, built the now defunct Idlenot Light Railway, which represented a Welsh line nestled against a natural hillside at his home in Southern NH. It was charming, with hand laid track and point work and a Roger Marsh Ogwen towing Tallylyn rolling stock...mmm! All this with a right of way no more than a foot in width with stations and passing sidings occupying perhaps a 3 foot by 10 foot area.

Here in the States, the Colorado three foot narrow gauge has the largest following. Long a haven for HOn3, finescale modelers tinkering over that last detail on a D&RGW flanger, the bug spread to the larger scales via the LGB Mogul. It wasn't long before these folks figured out that 3 feet between the rails as represented by G1 (45mm) track scales out to 1:20.3. Thus was born the whole segment of accurate 3-foot gauge modelling in 1:20.3 so well supported in live steam by Argyle Loco Works, Catatonk Loco Works, Poison Creek Loco Works, High Noon and others.

An interesting transition took place in parallel to the move to the more accurate scale. The prototypes being modeled were more often than not reflective of the logging and mining outfits in the Northwest, and some of the more obscure 3-foot regulated lines. So, today, you can steam up an accurate model of a small Shay and haul around a string of logging disconnects and caboose whose scale is accurate to the bolt head diameter.

There are more choices than these main stream narrow gauge themes. All of them will give you plenty of mental raw material when designing your garden line. The fun one gets from the research and planning is an important factor in keeping the fire stoked.

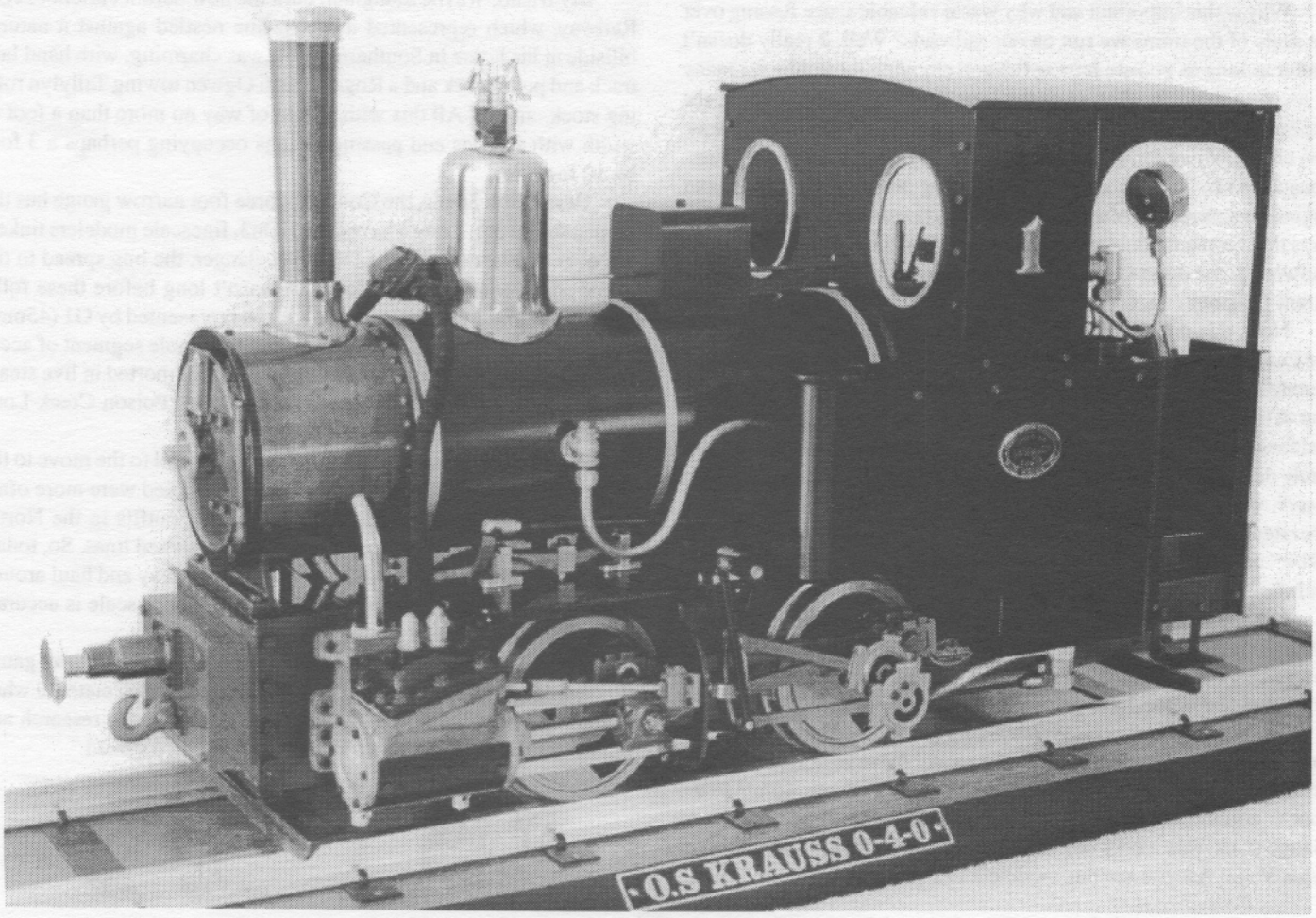


Loco Review – O.S. Engines Krauss 0-4-0

by Keith Holman
photos by Author

Technical Specifications:

Scale:	1:10
Gauge:	3 1/2"
Dimensions:	Length – 485mm (19"), width – 180mm (7-1/8"), height – 280mm (11"), weight – 18kg (40 lb.)
Boiler:	Locomotive type, silver soldered with 7 fire tubes of 12mm (15/32") diameter and 1 superheater flue of 21mm (13/16") diameter, grate size 75mm (2-15/16") x 72mm (2-13/16"), normal operating pressure 7 kg/cm2 (100 psi)
Fuel:	Coal (or LPG with optional burner)
Fittings:	Twin scale safety valves, blower valve, regulator, water gauge, pressure gauge, whistle and blowdown valve
Cylinders:	2 x 20.5mm (13/16") bore x 38mm (1-1/2") stroke with piston rings and manual drain valves
Valve Gear:	Outside frame Stephensons type, reversed by lever from cab
Lubricator:	Mechanical single ram, 3mm (1/8") bore x 7mm (1/4") stroke
Water Feed:	Axle driven pump 8mm (5/16") bore x 12mm (1/2") stroke, and hand operated pump 12mm (15/32") bore x 20mm (3/4") stroke
Available from:	O. S. appointed dealers



Although 3-1/2" gauge is not generally associated with garden railways, the O.S. Krauss 0-4-0 is a locomotive with a very short wheelbase of 4-3/4", enabling it to negotiate fairly small radius curves, and therefore worthy of discussion for those of us fortunate to have room for a 3-1/2" permanent way.

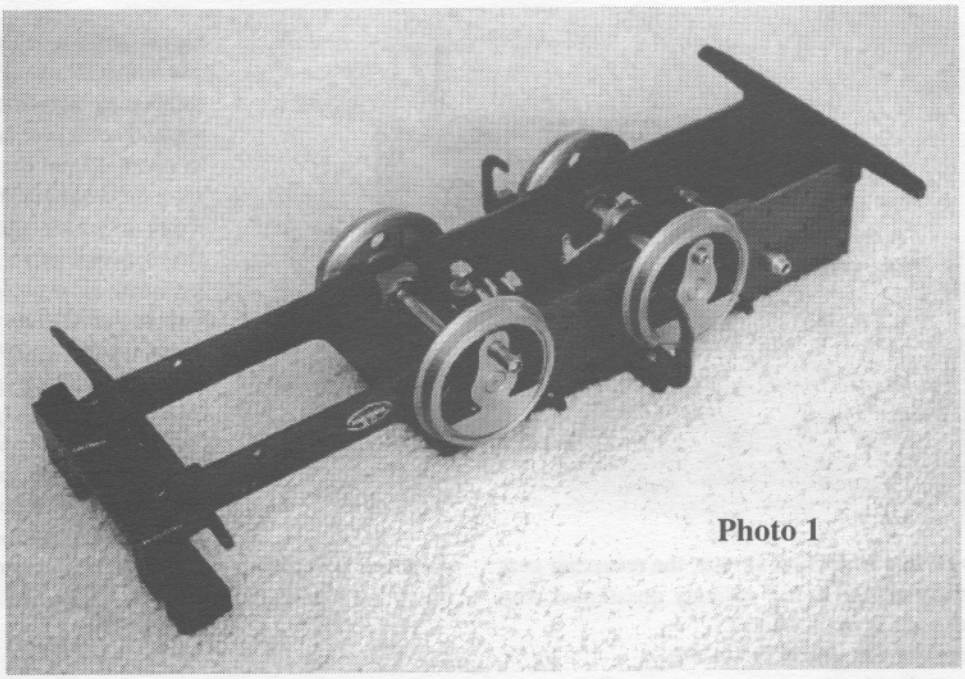


Photo 1

The model is based on the original German 2' 6" narrow gauge Krauss locomotive built in 1888, and is to a scale of 1:10. The model is available in either kit or ready to run versions. My preference was for the kit version. Having gained much experience from constructing nearly all of the various Aster models from kits, as well as many other live steam locomotives, I feel I have a good understanding of the workings of live steam models and can make any changes I believe to be necessary during the construction.

The kit arrived packed in a sturdy shipping box, and inside the various pieces were neatly and clearly packaged in numbered polyethylene bags. All of the parts are completely machined, and painted where necessary. A complete tool kit and even epoxy adhesive is included. As with all kits, a detailed examination of all parts, both for familiarization and to verify the contents against the parts list and check for any apparent damage is the first step. My kit had a twisted right hand frame, which was quickly replaced by O.S.

Read, understand and then reread the instructions. Although the instructions are clear and complete, some parts assembled in the early stages need to be removed later, a note of caution for those of us who like to use threadlocker on fasteners.

On to the assembly. The assembly is broken down into 16 steps, each with an exploded view of the parts and brief instructions. The assembly of the main frames and associated frame stretchers is straight forward, the main requirement being to ensure that the frames are exactly parallel and the ends square. The stretchers are very heavy castings, accurately machined, virtually ensuring correct assembly.

The wheels, water feed pump and eccentric are then added to the frame assembly. Be sure not to tighten (even by hand) the pipe joints into the pump body at this time, or you risk damaging the valve seats. Check the rotation of the main driving wheels to ensure the that pump operates freely. Mine had a tight spot where a small piece of brass had found its way onto the pump ram. **Photo 1** shows the completed frame and wheel assembly.

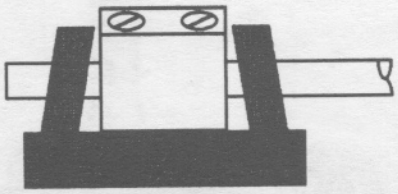
Next the cylinders, cylinder drain valves and lubricator are assembled. Here I discovered what was to be my only major problem with the kit. The slide valves and the valve nuts are both castings, and the valve nuts were able to move significantly, and also rotate, within the slide valve, due to much greater-than-required clearances. This would have led to inaccurate valve events if not corrected, so I machined the inside edges of the valves vertical and made new valve nuts. Slide valve modification is shown in **Diagram 1**. With this modification, the valves were prevented from excess and sloppy movement, and valve adjustment was much more accurate.

The cylinders and covers are supplied without any gaskets, silicon packing being recommended to ensure steam tightness. I quickly made a set of gaskets from 32 thou gasket paper for all the cylinder joints, as experience has taught me this method is much less likely to blow a leak. The cylinder drain valves need to have the operating levers soldered to them at this stage, and I later discovered, at the first air test, that one of the drain valves leaked, I suspect due to being overheated during soldering. I would recommend using a large electric soldering iron rather than a gas version.

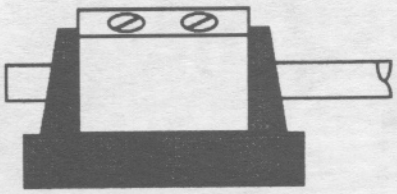
The side rods, foot plate (running boards) and suspension springs are then added, this step being very easy and without problem.

Next the slide bars, crossheads and return cranks are assembled, this step requiring a good deal of careful alignment to ensure that the crossheads travel both parallel to the frame, and without any up or down movement. Extra time spent here will ensure that no binding occurs when the air testing is carried out. Alignment rods are supplied to ensure the return cranks are accurately fitted and care must be taken to ensure the return cranks are fitted to the correct side, as the difference in appearance is minimal.

Diagram 1



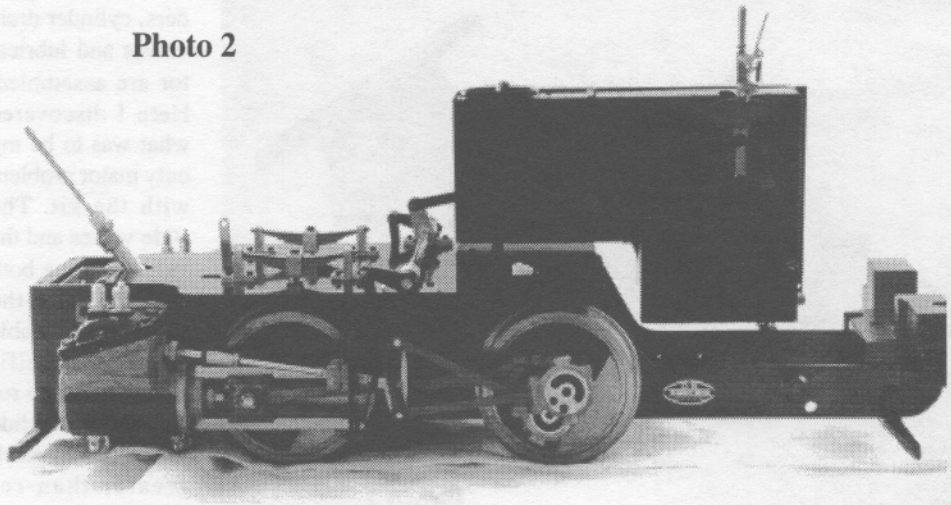
Slide Valve As Supplied



Slide Valve - Modified

The assembly of the valve eccentrics, sheaves and straps comes next. To get the correct alignment takes much patience and is one of those fiddly jobs where it if doesn't work, walk away from it and try again later. Never assume any tight spots found when you rotate the wheels and eccentrics will disappear with "running in". All that will happen is that the parts get worn out and rendered useless. I would estimate I fitted these parts 20 or more times before I was happy with the alignment. **Photo 2** shows the locomotive equipped for

Photo 2

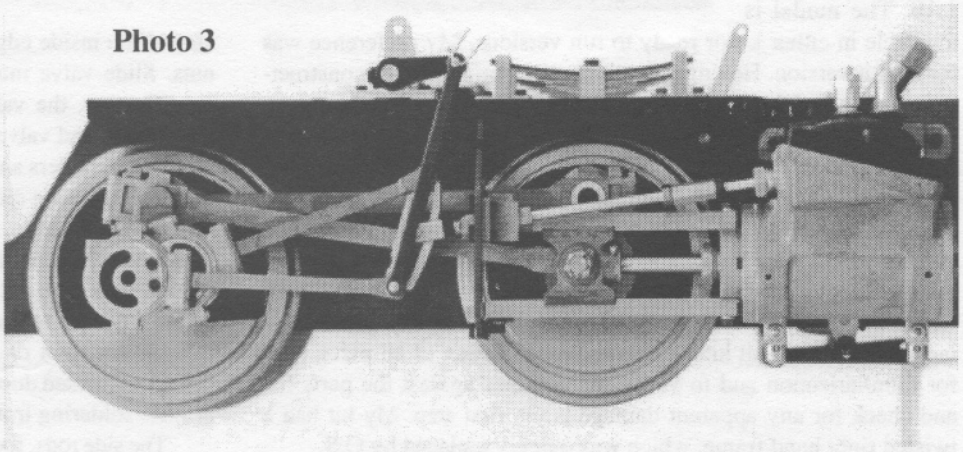


the air test. Before the all important first air test, the reversing gear lever assembly is carried out, and here I strongly questioned why such a thin reach rod was used. It would bend quite easily while reversing the gear. The reason, discovered later, is that the clearance between the side tank and boiler where the reach rod runs is very narrow, and a thicker rod just wouldn't fit.

The slide valves were aligned as per the instructions, and here I used a method I've always relied upon. I placed spacers between the axle boxes and horn stays to place the wheels at the same approximate height as if the locomotive was running under normal operating conditions. This ensures that the valve gear is lying in roughly the same plane as when under steam, and leads to far more accurate setting of the valves. This is especially true for inclined valves and valve gear, which is the case here.

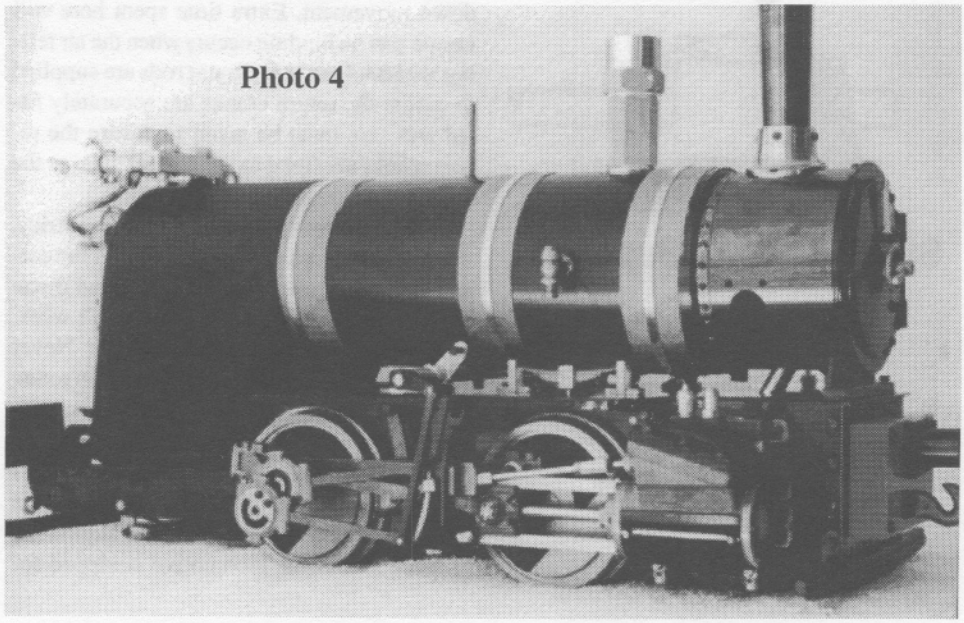
On to the first air test. I charged my air tank to 60 psi and made connection to the chassis with the supplied connectors. The lubricator oil tank was filled with steam oil (always use proper steam oil!), all of the moving parts lubricated with machine oil, and all was ready. The air pressure was slowly raised and at about 15 psi the wheels turned and ran smoothly, without any assistance on my part. Time to enjoy the sight of the outside Stephensons valve gear rhythmically turning away. How pleasant it is to see the valve gear both fully functional and in clear view when the locomotive is running. **Photo 3** shows the valve gear. I ran the air test for a total of 10 hours, replenishing the steam oil and lubricating the moving parts as required, by which time the engine would tick over at around one revolution per second, at less than 2 psi. The air tank was disconnected, the locomotive cleaned up, the valve chest covers attached, again using home made gaskets.

Photo 3



The brake gear and ash pan were next to be installed. The brake shoes are a very loose fit on the hangers as supplied, so I used small spacers to ensure that they didn't rub against the wheel flanges during normal running. Adjustment of the brakes is not carried out until the body work and brake handle are fitted. With the chassis finished, it was time to move on to the boiler. The boiler is of the locomotive type, all copper construction, silver soldered with 7 fire tubes and 1 superheater flue. Assembly of the various components is straightforward; the only item requiring care is the alignment of the water gauge glass to ensure the top and bottom fittings are in line. The kit includes ceramic sheet to insulate the boiler cladding from the boiler, and I replaced this with a thicker ceramic sheet to get a better air tight seal between boiler and smoke box, thereby ensuring a better draft from the blower / cylinder exhaust. One note here is that the drawings show the 2 clack valves on the boiler being adjusted by various thicknesses of copper gaskets, but none were to be found. A call to Rio Pecos found the solution. O.S. had

Photo 4



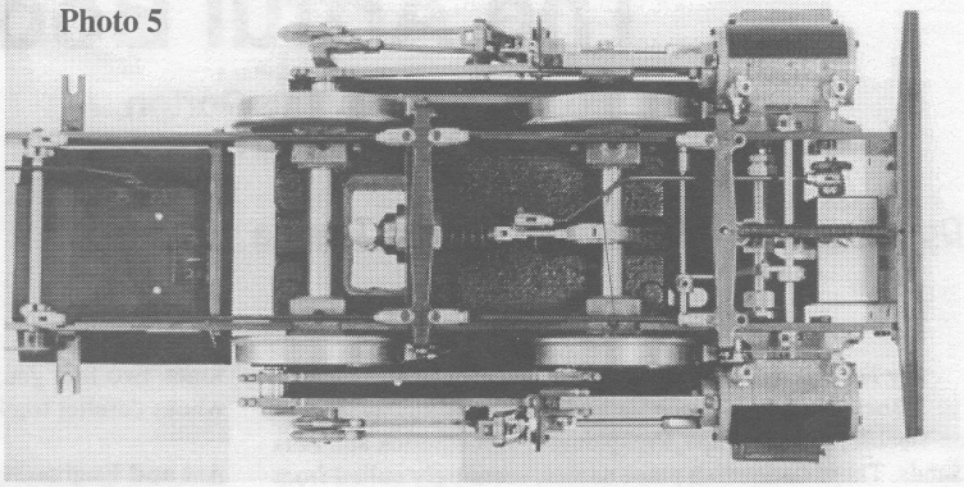
changed the design to incorporate thin lock nuts rather than gaskets, and new parts were promptly delivered. The smokebox is then attached to the chassis, and the boiler carefully lowered into place. The superheater and blower tubes are connected, together with the cylinder exhaust pipes. Again, I made gaskets for the flange between the pipes and the cylinders, rather than use silicon packing. **Photo 4** shows the boiler fitted to the chassis.

With the chassis complete, assembly moves to the superstructure and side tanks. A hand water pump is located in the right hand water tank, connected to the boiler via the usual clack valve. The side tanks are connected together via a balancing tube, and are fitted with plastic liners to carry the water. When attaching the side tanks, there is very little clearance between them and the boiler, and careful routing of the water pipes is required so that they don't become creased.

The final step involves the installation of the cab, roof, etc. One very nice feature is that the whole cab assembly can be removed later for servicing by removing just 6 bolts. One problem found here was that the supplied cab floor sits over to one side to clear the brake lever, and would benefit from a redesign. O.S. have agreed to look at this item. The brakes were adjusted, all fasteners checked for tightness, now it was time for the final test using compressed air. Again the air tank was connected and leaks checked for before shifting into forward gear and opening the regulator. No problems were found, and everything performed flawlessly. **Photo 5** is a bottom view, for those of us that like to see the workings.

All of the runs to date have been made using soft coal, distilled water being used to fill the boiler. The fire is quite hard to keep burning evenly, mainly due to the small grate size. The locomotive does not benefit from either an injector or donkey pump, so it takes more work than usual with the hand water pump to maintain the correct water level, especially on short, stop-start journeys. Priming has never been a problem, the steam pick up being at the very top of the dome. The loco is quite powerful, and, despite its small size, its weight of around 40 pounds enables it to pull quite a reasonable load. I intend to convert to LPG firing soon for further testing, as discussion with other Krauss owners has indicated more success with this method. The cab layout is relatively good, the only item slightly difficult to reach being the reversing lever. **Photo 6** shows the drivers view of the controls.

Photo 5

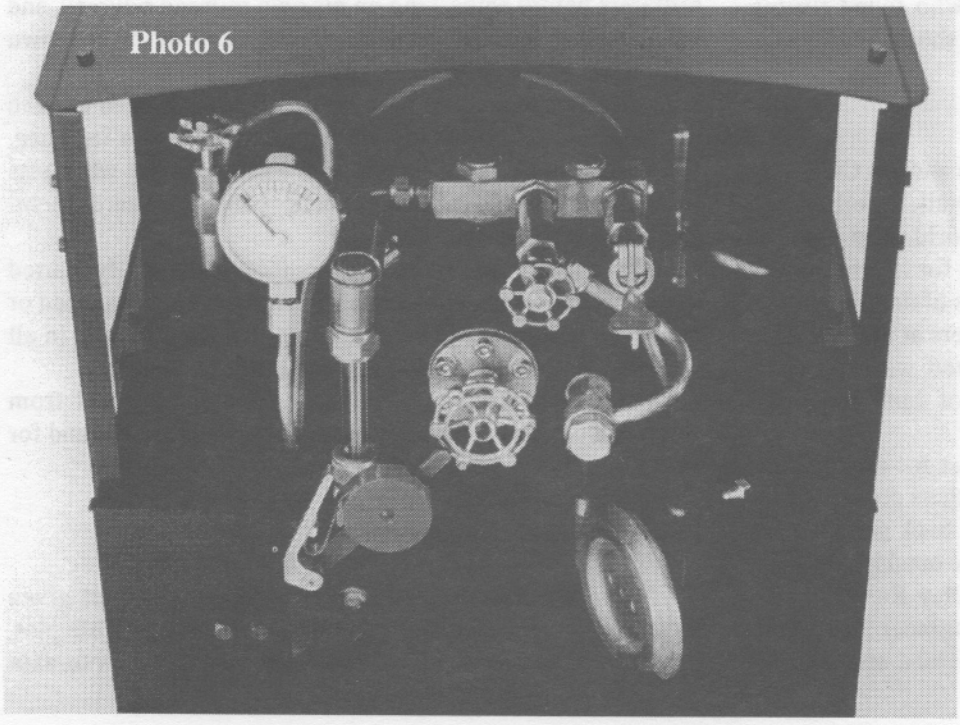


Summary

For those of us without either access to the necessary workshop equipment or the required amount of spare time, this kit provides an ideal way to experience the joy of assembling and then being the fireman, driver, engineer and passenger of a small, coal fired locomotive. The locomotive can be quite easily carried by one person, and should, with the usual procedures of cleaning and lubrication, have a long service life. The outside valve gear is a delight to watch, and the model very appealing to look at. Although the kit price is not inexpensive, all of the parts, apart from those noted, are accurately and very well made. The finalized locomotive is well enough finished to be considered worthy of display, and the attention given to correcting the problems from both Rio Pecos and O.S. Locomotives was superb.

Anyone interesting in hearing more details of my experiences with this kit may contact me at: PO Box 123 Windsor, CA 95492 or e-mail to <STEAM4ME@aol.com>.

Photo 6



The Artful Bodger

by Tag Gorton
photos by the author

Down among the Cornish Narrow Gauge

By Tre Pol and Pen, thou shall know all Cornish men.....

Boswednack, Mousehole and Illogan Highway. Praze-an-Beeble, Ventongimps, Prospidnick, Trebetherick and Praa Sands. These outlandish place names, seemingly culled from an obscure Tolkien fantasy, trip up the tongue and confuse the many holiday visitors to Cornwall in the far west of England. Most of these names are relics from an age when the ancient Cornish language was still in use and Cornish folk were commonly supposed to be a swarthy mix of old Celts, leavened with survivors from the Spanish Armada and visits from even earlier Mediterranean traders, sailing in search of Cornish tin.

The holiday advertising literature of the erstwhile Great Western Railway promoted their "Cornish Riviera" with inexpensive travel guides encouraging holiday visitors with the grandeur of our rugged coastline and romantic stories of smugglers and wreckers. Those early holiday makers enjoyed the beaches, sampled the delights of Cornish cream teas and purchased their "lucky Piskies" from canny locals who found fishing for tourists less onerous than following the shoals of pilchard!

Mine Tramways

There is, however, another side to this ancient Celtic enclave, because here, in the centre of Cornwall, is perhaps the first heavily industrialised area in the world. The town of Camborne, famous through out the world for its mining expertise, is surrounded by the engine houses of derelict mines, their broken chimneys pointing dead fingers at the sky. This shattered, bracken covered vista is scarred with old spoil heaps, and crisscrossed with the routes of early industrial tramways.

Time and Mother Nature have, at least for me, lent enchantment to this man-made landscape with its crumbling industrial remains and it is here, in the long back garden of an agreeably modernised miners cottage on the outskirts of town, can be found the l6mm scale Tincroft Valley Railway. This delightful garden line created by skilled engineer Steve Morris, ably assisted by his wife Joanne, is named after the defunct, two foot gauge, Tincroft Mine horse-drawn tramway, whose derelict trackbed curves close to the cottage.

Art and Engineering

Now this series of articles is intended to explore all aspects of our hobby, rather than just to present a selection of garden railroad profiles. For you see, I believe that our "scenic scale" live steam trains, operated in the open air, bring together the artistic "modeler" with the horny handed engineer, in a way that has not been seen for many years. It is for this reason that I consider the Tincroft Valley line to be of particular interest, because it presents a peerless combination of engineering skill, artistic excellence and miniature gardening ability.

I consider the Tincroft Valley line to be of particular interest, because it presents a peerless combination of engineering skill, artistic excellence and miniature gardening ability.

Steve is a comparatively recent convert to modelling in the open air, and after many years honing his modelling skills in fine scale gauge 0, he has paid particular attention to the work of other garden railfarers before embarking on his own railroad odyssey, and has certainly learned from the mistakes made on my own Longlands & Western!

As few commercial parts as possible have been used in the construction of this unique model railway. For instance, the rolling stock is all handmade, with even the wheelsets being turned on site – although I believe the axle guards themselves are commercial products!

The current stud of steam locomotives actually started life as Merlin items, but so many parts have been replaced or improved before complete rebuilding that they should, in all conscience, have Tincroft Railway builder's plates.

Diesel locomotives have since been constructed from scratch at the Tincroft Valley works and plans are in hand for steam engines of pure TVR design.

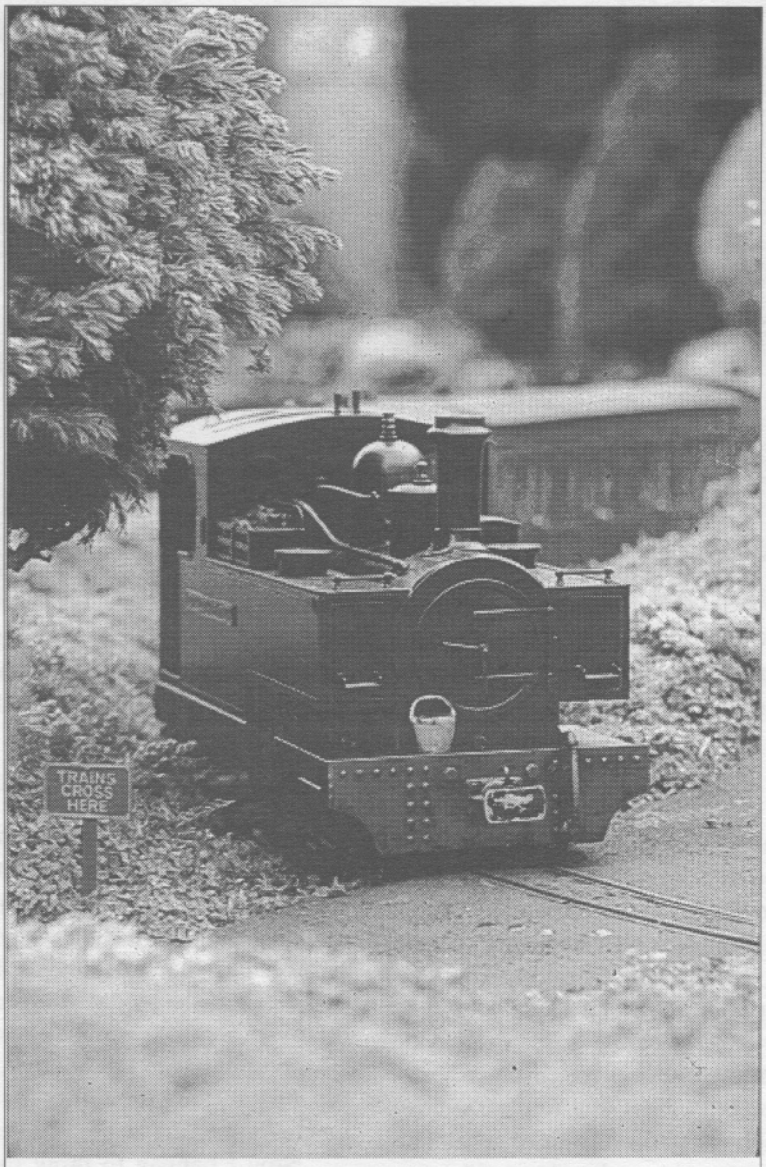
Landscape and Design

This garden is divided into two areas, with part given over to lawn and recreation and the working vegetable plot, greenhouse and shed, all screened off with a trellis to ease

one's conscience on a lazy Sunday afternoon. With a young family and the various pressures that this puts on the garden environment, it was considered that a "dogbone" design would frame the lawn and provide a comfortable area from which to watch operations without monopolising the recreational space.

Modifications since the design of this original concept have meant that trains run on the single line through the carefully landscaped raised area around the lawn, passing through a tunnel to traverse the vegetable garden and circumnavigate the greenhouse before reappearing back through the tunnel into the recreational section.

On the landscaped part of the line, the curve around station hill is incorporated to provide a continuous run if required. The main through station has a passing loop with a goods yard fan of spurs and a separate steam servicing bay with engine shed. Gradients are kept to a minimum because, while most newcomers to garden steam relish the idea of driving their locomotive in all types of conditions and therefore deliberately plan in gradients, they find that inclines of any sort very quickly become a pain in the fundament when one wishes to relax with a cool drink and just watch the trains go by!



The epitome of the country railway! A heavily weathered Merlin Meteor negotiates a grade crossing on a sunny late summer afternoon with the market special.

Blasting through the Curves

Hard driving conditions can very easily be created in any case by taking charge of a long and heavy train with your steam locomotive. The narrow gauge curves obtained in all but the largest of gardens will provide exciting aural and visual effects as your locomotive blasts through a reverse curve with a heavily laden consist and 40 psi on the gauge!!

Running the trains through the unseen vegetable patch at the end of the garden may not be considered particularly appealing, but the very fact that one's train effectively disappears behind the screened off section itself provides an illusion of length and distance.

It's also worth mentioning that part of the pleasure of train watching is anticipation, and to hear the sound of an approaching train working hard before bursting from the tunnel in a cloud of steam exhaust is something very difficult to simulate on an indoor model railroad.

Civil Engineering

The mundane practicalities of civil engineering in the garden are, like the construction of baseboards, not the most interesting part of model railroad construction. Nevertheless, a strongly constructed roadbed will reap dividends in avoiding difficult remedial work at a later stage, and will free time for the more pleasurable activities of running trains and creating a living 16mm scale landscape. On the TVR the road bed is constructed with concrete blocks and shuttered concrete. There are treated timber blocks set in this formation to provide a fixing for the track, and it can be said that this type of construction is similar in many ways to the "open baseboard" type used indoors.

The whole of the railroad territory is raised above the general level of the garden and the front of the fabrication faced with rolls of half round timber. Within this sector the track bed itself is rock solid and level while the landscape may be terraformed around it.

Framing the Landscape

At this stage the bare bones of the landscape were formed. Elements of the scheme included a roadway running over the track by means of a skew bridge to the station, an ungated

Corsican sandwort provides a close green carpet beneath the trees, and in the background a small pond is fringed with babies' tears. In a few moments the peace of this pastoral scene will be momentarily broken by the passage of the pick-up goods out of Dolcoath. Meanwhile, the permanent way gang are brewing tea and having a bit of a gossip whilst out of sight of authority.

grade crossing, a bridge over a pond and the tunnel through to the kitchen and herb garden. It is largely at this stage where imagination and the ability to design a three dimensional artwork becomes important. All readers will be aware of this particular skill because it is one that indoor railroad modelers have, in recent years, exported to the previously aggressively engineering orientated world of the garden railroad. The skew bridge over a shallow cutting, for instance, produces an evocative landscape ingredient that imparts a nostalgic framework for a branch (shortline) train of whatever gauge, while the girder bridge provides a lovely rumble as a heavy steam locomotive takes its train over the lake.

Trackworks

The TVR track itself has plastic ties. Many outdoor lines, including my own, use wooden ties because it is regarded as "the real thing" in miniature – just like live steam, in fact! Certainly it is the real thing and, like the real thing the timber ties will eventually rot away unless punctilious maintenance routines are in place. There are, for instance, areas of my Longlands & Western where the ties have been hidden under the ground cover vegetation these many years, with just the twin curves of the railheads showing. Now this is a personal idiosyncrasy. I like it that way because it reflects the gentle air of decay that surrounded British narrow gauge railways in their final sleepy days before closure or preservation – and therefore creosote is not allowed anywhere near this growth! However, it has to be said that, like the decaying railroads of the thirties, the probability is that my metals are also held to gauge by the turf as the ties become part of the topsoil!

Now I happen to think that steam railroads run on romance, but in this case I wish I had been rather more pragmatic in my choice of trackage. Modern garden railway plastic tied track is chemically inert and can be used to simulate either immaculate well heeled trackage or the bosky, rundown permanent way of the failing railroad company.

Tincroft Valley trackwork gives the appearance of an efficient, well used line, without the Disney World neatness of some modern narrow gauge railroads. It is, however, *most* carefully laid, with cross levels and curves carefully set with a spirit level. Whatever track *looks* like, it is important in

this scale to have perfect running and, because it is difficult to adjust afterward, this must be achieved at the track-laying stage. This line is ballasted with a mixture of sand, cement and horticultural grit, largely soaked in old oil to provide a realistic appearance.

Clothing the Landscape

The l6mm living landscape in the Tincroft valley is deceptively simple without a huge variety of plantings. Ground cover in the form of *Soleirolia soleirolii*, sometimes known as baby's tears, covers almost all the landscape. This plant is also in common use on the Longlands & Western and is ideal for providing a lush green carpet beneath the trees. The diminutive countryside produced by Joanne and Steve is dotted with delicately pruned and placed miniature conifers, together with one or two carefully chosen alpine plants. Sometimes on garden lines, railroad buildings and man-made structures can intrude a little too much into the garden landscape. Certainly the only scenic effects seen in an earlier epoch of garden railroads tended to be depots, signals and the like, added to harshly obtrusive viaduct construction. The understated effect, however, of a simple artifact such as a fence, a road or a lamp post in the landscape, together with the linear line of the track and perhaps a carefully placed human figure, can scale the growing scenery and maybe provide a gentle reminder of rural railroads from an earlier, less frantic era.

The TVR has many appealing little cameos of suggested human activity, from the fisherman and dog by the pond, to the rake of rusty tippers in a refuge spur, with a group of gangers idling their "snap' time away beside them. In one arcadian corner of the landscape, an old horse drawn trap is quietly disintegrating beneath the trees, while on station hill, a pastoral background to shunting (switching) activities is provided by a herd of cows, grazing the satisfactorily sized Corsican sandwort in a small roadside field, framed by carefully tended miniature conifers.

Rolling Stock

The rake of scarlet liveried passenger cars is the latest project completed by Steve, although, as he says, they were a long time in the making, largely because of his preference for freight stock. Nevertheless, they have been constructed with the same skill and attention to detail as the rest of the railroad. Another newcomer to TVR metals is the sleek four coupled d****l locomotive, built to TVR design. This engine does not boast radio control but utilises a "slow start/ slow stop system". This means that a tap on the "off" button as the locomotive approaches the station will result in a gradual and prototypical station stop. Similarly, the train will accelerate smoothly away and run happily to the limits of the battery power.

I don't at present have any non steam locomotives in my LWR stud, but as Steve says, it is quite nice to have a train running through the garden without attention whilst one is conducting maintenance on the railroad, or even some of the more mundane gardening tasks!

Projected Works

There are many more projects in the pipeline and, like most of our railroads, the TVR will never be completely finished. More building works are planned and certainly steam locomotives will be built from scratch in the TVR shops. There is, as yet, no signalling on the railway and fencing of the line, together with a telegraph pole route, are possibilities for the future. I look forward to seeing future developments on Steve and Joanne's Cornish narrow gauge empire, and am keenly anticipating the first in-house TVR steam locomotive rolling out of the shed.

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BUILDING THE VEST POCKET CLIMAX

text and photos by Mel Ridley

drawings from the author's sketches by Harry Wade

Part 4 – Transmission

4:0. TRANSMISSION: We now deal with production of the various components to make up the Valve Gear, Assemble the Gearbox and fit Rocker Arms. Universal Joints for the final transmission will be covered in Section 5.

MATERIALS REQUIRED: 1 set of castings comprising Slip Eccentrics & Stop Collars, Rocker Arms and Universal Joint couplings. A piece of P/B or Brass roundstock (See ** Note below) to fashion a couple of Eccentric Straps 13/16" o/d x 7/64" thick, 4" of 1/16" s/s rod, an inch or so of 3/16" hex brass and 3" of 5/32" steel hex for the spindles and bolts, 4 x 6BA grub screws, 8 x 1/2" 8BA steel screws & nuts, 2 - l0BA steel nuts and a couple of 1/16" x 1/2" long split pins.

*** Note. For just the two straps that you will require, I feel sure that lying around somewhere in a plumbing supplies merchant, will be a suitable brass fitting that can be carved up for this operation, rather than buy a hunk of brass, most of which will be reduced to swarf.*

4:1. ECCENTRICS & STOP COLLARS: Before cutting the eccentrics off the sprue, drill & ream through 3/16". The stop collar is best done very slowly from the plain side as it will tend to 'bite' half way when it meets the flange on the other side, throwing it off-centre. Remove from sprue, drill & tap 6BA into the centre of the main body - see sketch - too far to one side and it will 'wind' over when the grub screw is tightened onto the shaft.

4:2 ECCENTRIC STRAPS: Turn up two eccentric straps 13/16" o/d, centre drill, and bore to approximately .489". This was nominally 1/2", but differential casting shrinkage varies so it's try & fit time. Too much slop and it will affect the valve events. Part two off, each 7/64" thick, and drill & tap 10BA for the spindle.

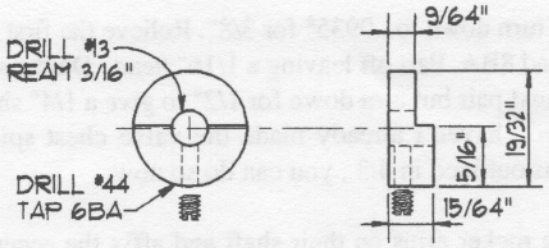
4:3. ECCENTRIC SPINDLES: Cut off two lengths of 1/16" s/s rod, each 1.11/16" long. As an easy guide to threading, use a jewellers saw to make a just visible saw mark 1/16" on one end and 9/32" on the other, including the thickness of the saw blade. Mount the l0BA die in the 3 jaw, hold the spindle in the tailstock chuck and using plenty of cutting compound, rotate the chuck by hand, cutting a thread up to the 1/16" mark. Turn around and repeat for the 9/32" end. If you are using a split die, slip a piece of brass shim into the slot to prevent the jaws closing up on the thread.

We now have to make a couple of bushes 3/16" o/d x 1/8" long to link the spindle ends to the rocker arms. Dress one end of some 3/16" hex, centre drill & bore Nº 42 (.0935") for 1/2" or so, marking the position of Nº 1 jaw. Remove from chuck and, using the drillshank as a brace, mark two pieces 1/8" long plus the thickness of the parting tool. Pop the centres on one of the hex faces. Drill & Tap l0BA through to the bore. Remount in the chuck to the same position against Nº 1 jaw, turn off the flats down to 3/16" o/d and part off two bushes. When we come to the valve chest spindles, we'll require a couple more of these, but 1/4" long, not 1/8", so if you want to do these at the same time, it will save setting up later.

Cleaning both parts thoroughly, screw gently onto the spindle using the drill shank as a stop, wind back about 1/8th of a turn and, removing the drill, heat up to bright red and silver solder. After cleaning, check that the bore is clear. If for any reason the shaft has slipped back into the bore during soldering, don't try & file it out, all that will happen is that you'll open it out, so scrap it & start again. Run a l0BA steel nut down the other end, screw it into the Eccentric Strap and gently tighten up.

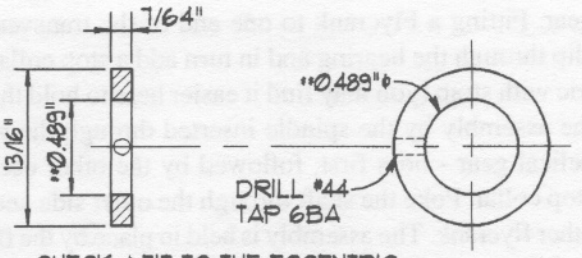
4:4. The components for the Gearbox are now complete except to shorten the Helical Gears. Saw or part off the transverse gear for the primary drive shaft down to 9/16" overall length. The gear for the universal shaft should be shortened to 21/32" to fit between the bushes. For a real Rolls Royce fit - (ahem! - Cadillac, Mercedes, Lexus), you can reduce this dimension by a further 1/16" and fashion up a couple of 1/32" thrust washers if you like.

4:5. GEARBOX ASSEMBLY: Refer to Drg.4:5. You will notice that of the two windows in front of the box, the left hand one, (as mounted in the loco) is offset from centreline. This is to accommodate the boss on the 9/16" long helical



STOP COLLAR (4:1)

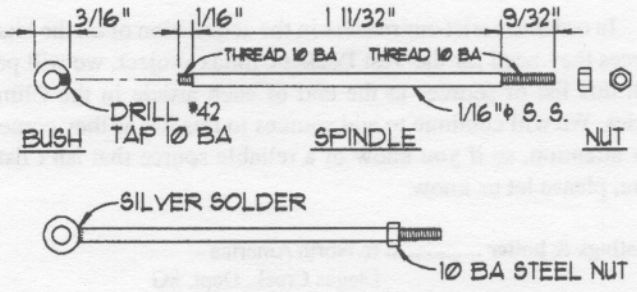
2 OFF - BRONZE CASTING



** CHECK & FIT TO THE ECCENTRIC

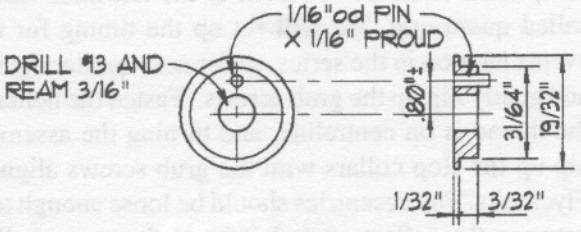
ECCENTRIC STRAP (4:2)

2 OFF - BRASS



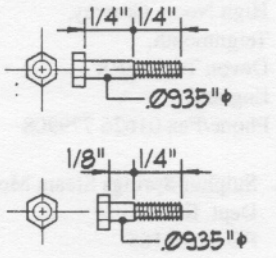
ECCENTRIC SPINDLES & BUSHES (4:3)

2 OFF - 1/16" STAINLESS STEEL ROD, 3/16" HEX BRASS



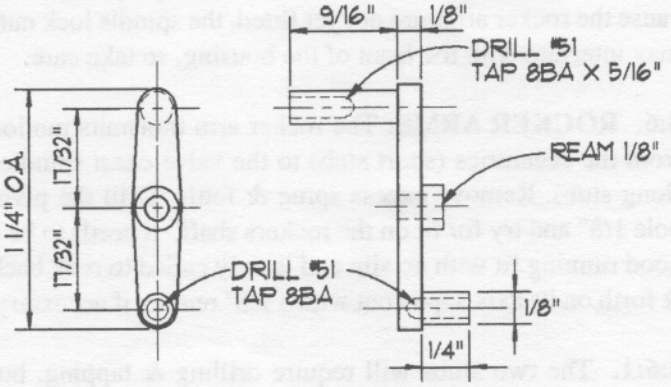
VALVE ECCENTRIC (4:1)

2 OFF - BRONZE CASTING



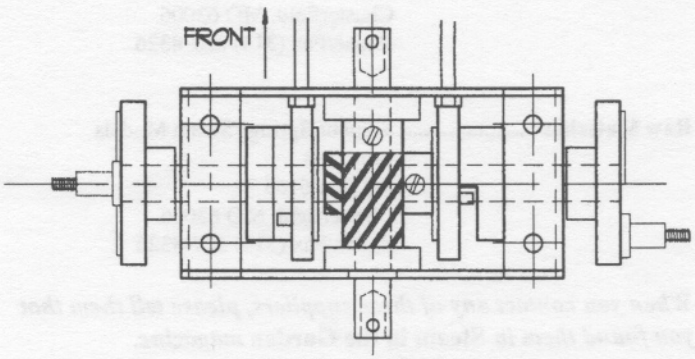
ROCKER SCREWS (4:6:2)

2 OFF EACH - 8BA (5/32" HEX STEEL)



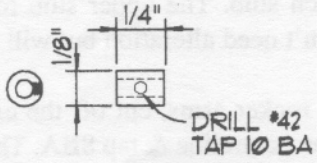
ROCKER ARMS (4:6)

2 OFF BRONZE CASTING



UNDERSIDE VIEW

OF THE GEARBOX ASSEMBLY



VALVE ROD BUSH (4:3)

2 OFF - 3/16" HEX BRASS

UNLESS SPECIFICALLY NOTED, ALL PARTS ARE DRAWN FULL SIZE.

THE VEST POCKET CLIMAX

Locomotive design by Mel Ridley
Drawings Copyright © 1997 by Harry Wade

gear. Fitting a Flycrank to one end of the transverse shaft, slip through the bearing and in turn add a stop collar, eccentric with strap (you may find it easier here to hold this part of the assembly by the spindle inserted through the window), helical gear - boss first, followed by the other eccentric & stop collar. Poke the shaft through the other side and add the other flycrank. The assembly is held in place by the flycranks, and the eccentrics abutting the helical gear are held together in turn by the stop collars.

It is normal practice for the right hand engine or cylinder to lead, and it is set 90° in front of the left hand side. This is called quartering. We will set up the timing for the valve events later on in the series, so for now quarter the flycranks and gently nip up the grub screws. Fasten the helical gear so the thread is on centreline, and turning the assembly over, nip up the stop collars with the grub screws aligned to the Flycranks. The eccentrics should be loose enough to revolve between the collars, and also rotate through a half turn for forward & reverse.

Slide in the universal shaft, inserting the driven gear with the boss to the front, and rotate the assembly by hand. Because the rocker arms are not yet fitted, the spindle lock nuts may interfere with the front of the housing, so take care.

4:6. ROCKER ARMS: The rocker arm transmits motion from the eccentrics (short stub) to the valve chest spindles (long stub). Remove excess sprue & fettle. Drill the pivot hole 1/8" and try for fit on the rockers shaft. It needs to be a good running fit with no slip and is only called to rock back & forth on its axis. Open out with a 1/8" reamer if necessary.

4:6:1. The two stubs will require drilling & tapping, but before that the short stub will require to be shortened, so mount them between the frames on the shaft - the long stub on top and pointing outwards. With the arms hard-up against the inside of the frame, align the eccentric spindle bushes and measure off how much to remove. It should effectively be 1/8" for each stub. The upper stub for the valve chest spindle shouldn't need alteration but will be checked later.

Removing the rocker arms, cut off the excess length, drill right through on centreline & tap 8BA. The arms are cast in manganese bronze and so are pretty tough. Use plenty of cutting compound, and I recommend using taper, 2nd and plug taps for this purpose. Drill the longer stub for about 5/16" and tap full for 1/4".

4:6:2. ROCKER SCREWS. We now need to make four shouldered screws or bolts to attach the spindle bushes. Made from 5/32" steel hex - for 8BA a/f - they are of different lengths. Two to 7/16" and two 9/16" overall. Chuck in the 3 jaw and turn down to .0935" for 3/8". Relieve the first 1/4" and thread 8BA. Part off leaving a 1/16" head. Do the same for the next pair but turn down for 1/2" to give a 1/4" shoulder. If you haven't already made the valve chest spindle bushes as outlined in 4:3., you can do so now.

Refit the rocker arms on their shaft and affix the eccentric spindles. When we come to fit the cylinder assembly, these will need adjustment.

SOURCING

In order to assist our readers in the acquisition of all the bits & pieces they need for the Vest Pocket Climax project, we will publish this list of sources at the end of each article in the Climax series. We will continue to add sources to this list as they come to our attention, so if you know of a reliable source that isn't listed here, please let us know.

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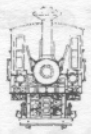

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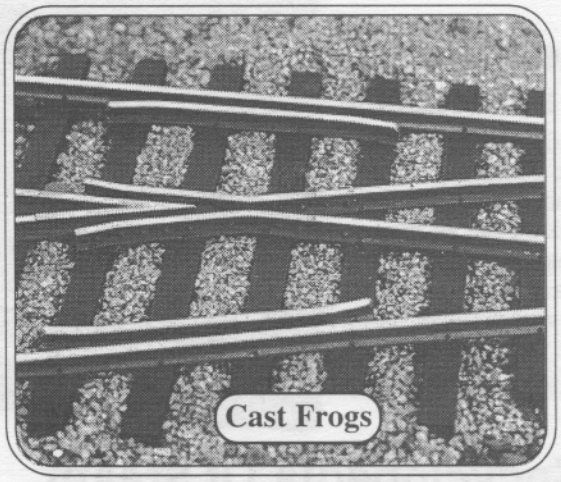

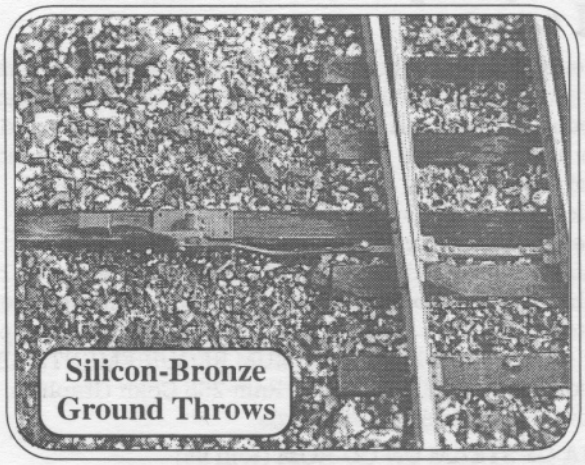

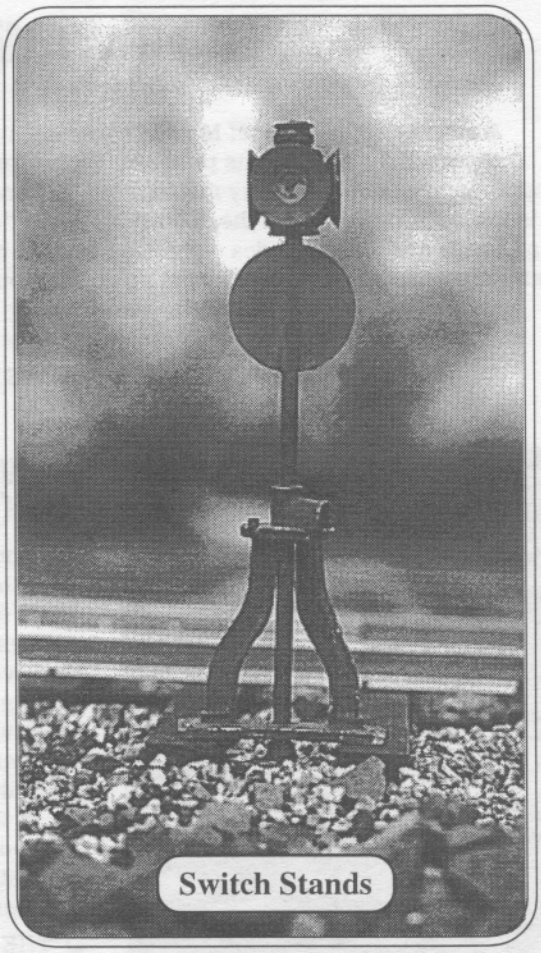

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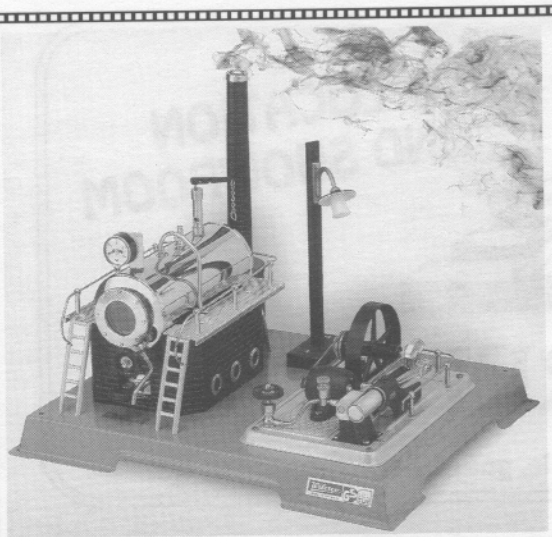

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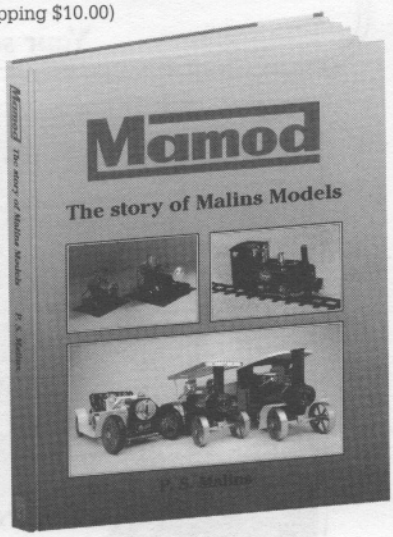

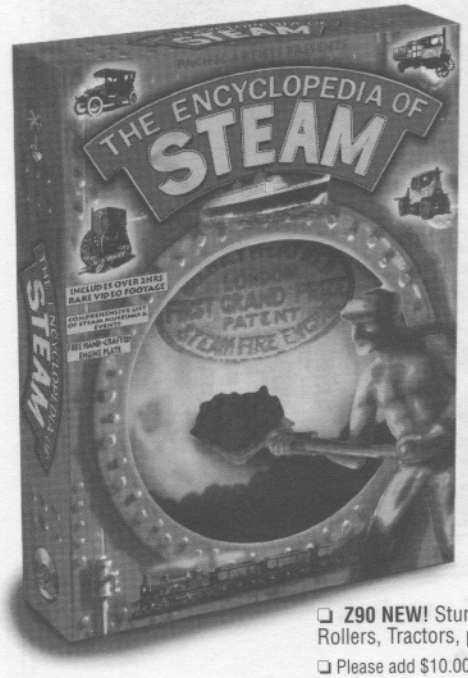

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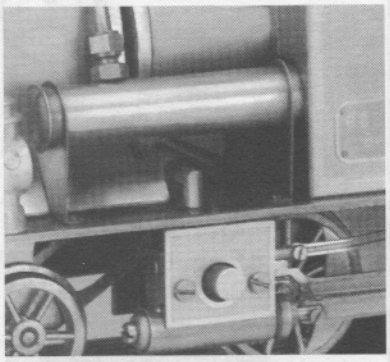

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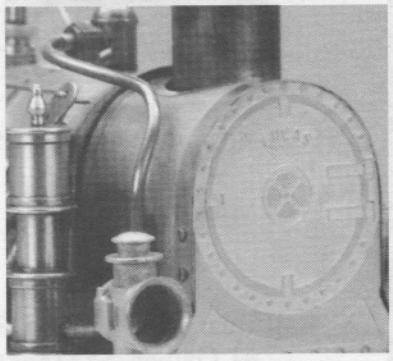

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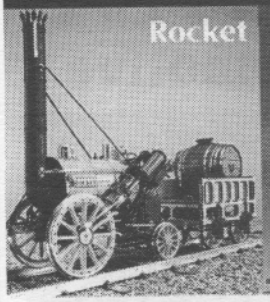

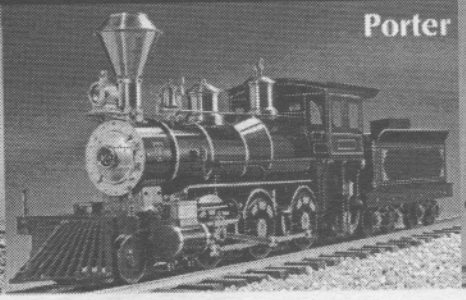

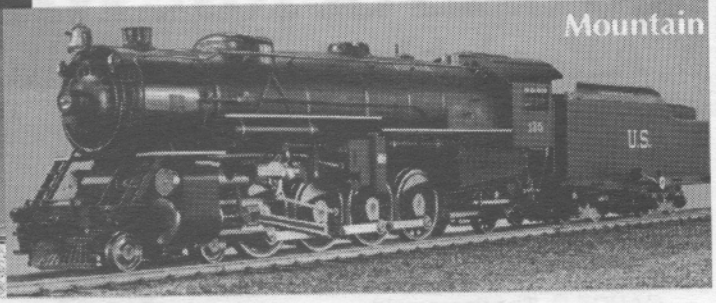

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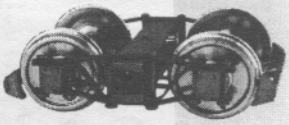

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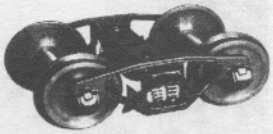

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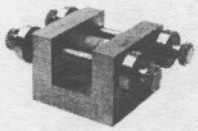

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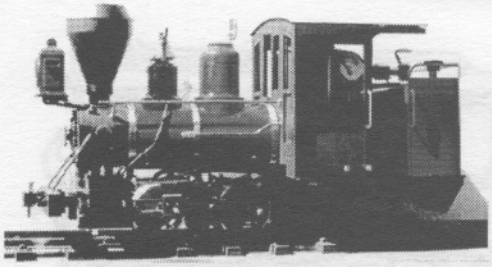

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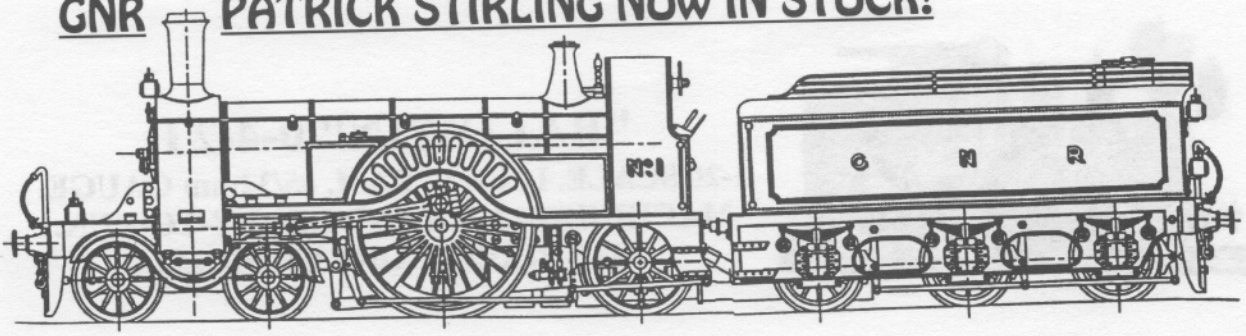

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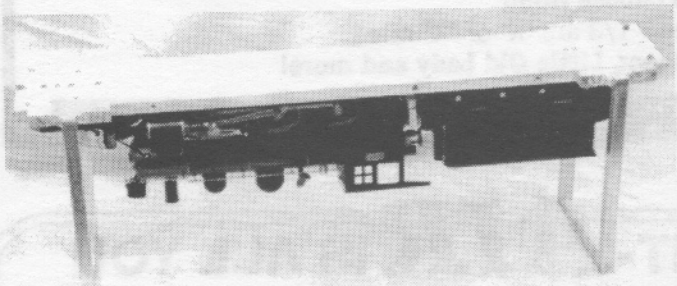

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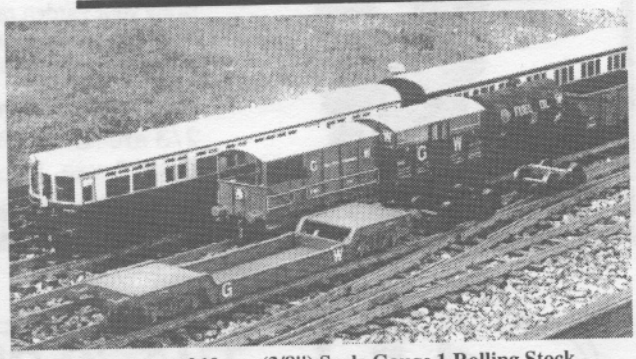

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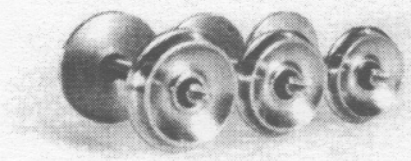

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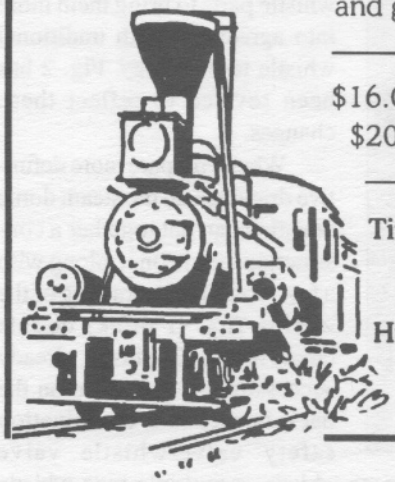

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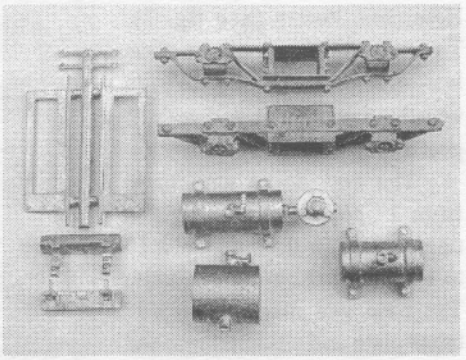

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HARMONIC STEAM WHISTLE REVISITED

by Larry Bangham

article, photo and drawings by the author

More whistle magic from the wizard

I just wanted to share with all you whistle lovers the latest episode in the continuing saga of the Harmonic steam whistle. As you can see, the whistle on my C&S Mogul is back where it belongs - on top of the steam dome (see photo Nº 1 & fig. 1)!

I had been contemplating building a more prototypical steam dome (fatter), when inspired by Murray Wilson's astute remark (RPO Mailbag SitG Nº 36) that "The resonator can be any shape", I checked the volume available and discovered it was more than adequate for my new mini aperture to produce a low pitch. The mini aperture was developed as a result of several requests for a whistle for the Maxwell Hemmens Porter (See fig. 2). This aperture uses about 30% less steam than the previous whistle (SitG Nº 35), and yet still gets a nice tone.

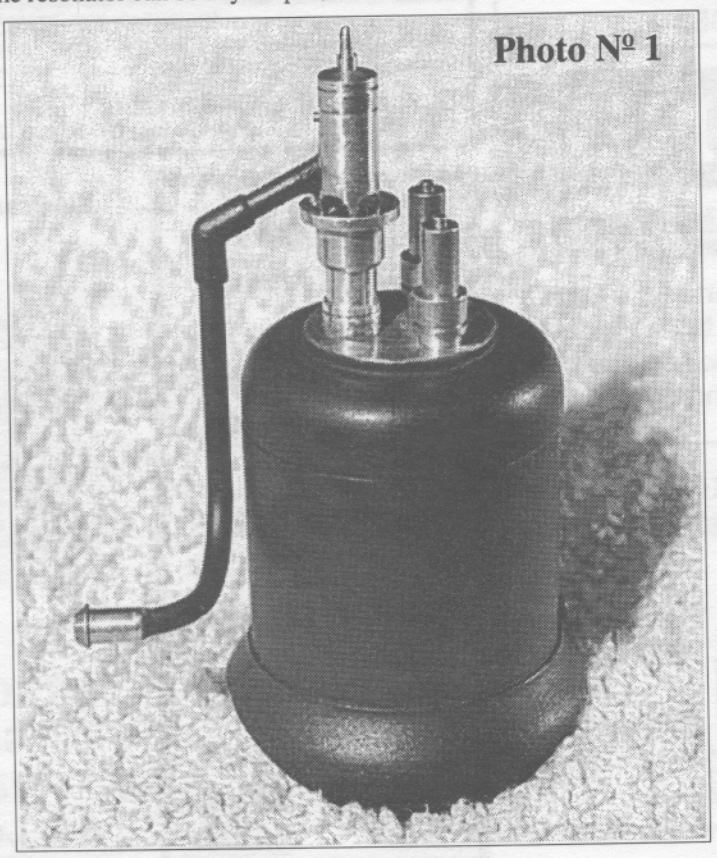


Photo Nº 1

The new dome was made from 1" copper plumbing fittings, a cap for the top, and a 1" to 1.1/2" transition for the body. The base was made from 3/8" brass plate and soldered into the body. The resonator cavity is made from copper sheet and wraps around the safety valve. By mounting the aperture upside down on top of the dome and bringing the steam in from the side, it captures the appearance of a real whistle. The deflector sends the steam plume straight up (a sight to behold).

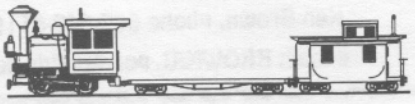
Recently I completed yet a smaller version of the dome whistle which would be more suitable for 1:32 scale and the smaller size locomotives. I believe this smaller version is right at the lower limit of attainability. I tried one even smaller (0 scale), but could not coax it into working. It made plenty of noise, everything from a tug boat air horn to a party noise maker, but would not sound like a steam whistle. Scaling down volumes while trying to keep full size sound waves – or at least realistic ones – may have reached its limit. These are by no means peep–peep whistles. It is surprising that such a big sound emanates from such a small device.

I have installed a stationary steam plant in my shop, and I would like to thank Ed Warren of Steam 'n' Stuff for his excellent little vertical boiler, and Harry Wade and Kevin O'Connor for all the accessories. This will make steam tests much more convenient with hopefully less finger burning during hook ups and adjustments.

Peter Trounce of Canada sent me some very interesting articles on whistles. One article detailed an early version (1949) of a resonator type whistle by L.B.S.C. In this article it mentions an even earlier type (1909). So the technology has been around awhile but apparently was never developed to the point of practicality. Hopefully this time it will be different.

Allan Starry of Washington state also sent me challenging articles on a multiple chime whistle and automatic snifter valves which got me to thinking. After reading all of this interesting information I decided to change some of the names of my whistle parts to bring them more into agreement with traditional whistle terminology. Fig. 2 has been revised to reflect these changes.

When I prepare more definitive drawings on the steam dome whistle I can put together a construction article on it, along with a few words and a drawing of the worlds first (I think) double chime harmonic whistle, already successfully tested. Also on the back burner is a combination safety valve/whistle valve mounted under the steam dome whistle, a multiple tone whistle with a big voice for the Big Boy, along with an improved whistle valve, automatic snifter valves and maybe an inertia motor installed on a tender truck, and....who knows what else? I hope I live that long. I am learning all kinds of things about whistles. Just think, had I enrolled in Beginning Whistle Design 101, I might have at least learned the proper terminology for all the whistle parts. On the other hand I might have learned that experimentation has been going on for one hundred years and that everything had already been tried. As always, I will be glad to talk to anyone with a question or a solution. Happy Quilling!



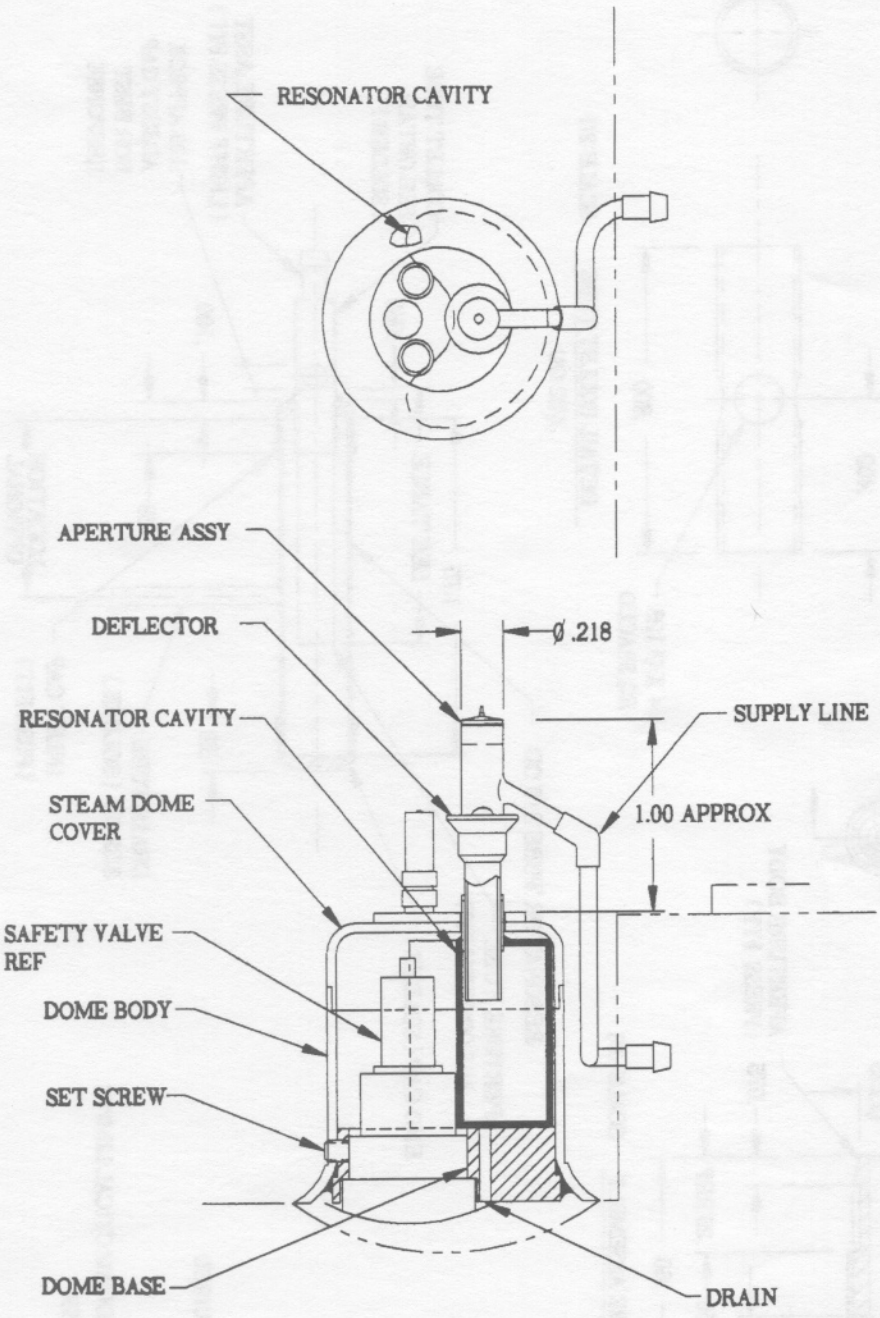


FIG. 1

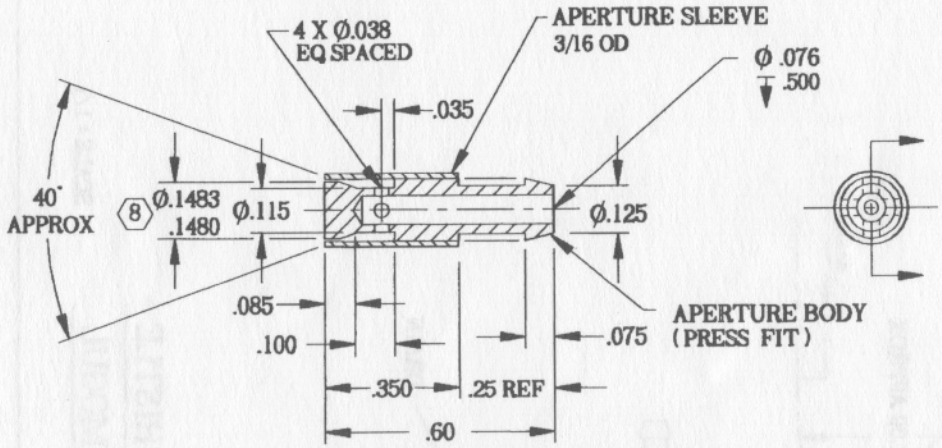
OUTLINE DRAWING
HARMONIC STEAM WHISTLE -
STEAM DOME , C & S MOGUL

whsd10

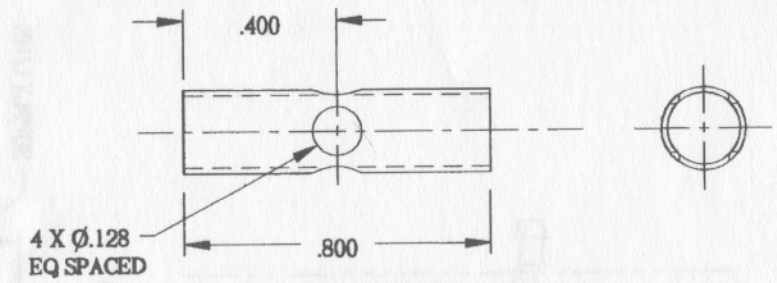
L. BANGHAM 2-25-97

SCALE : 1/1

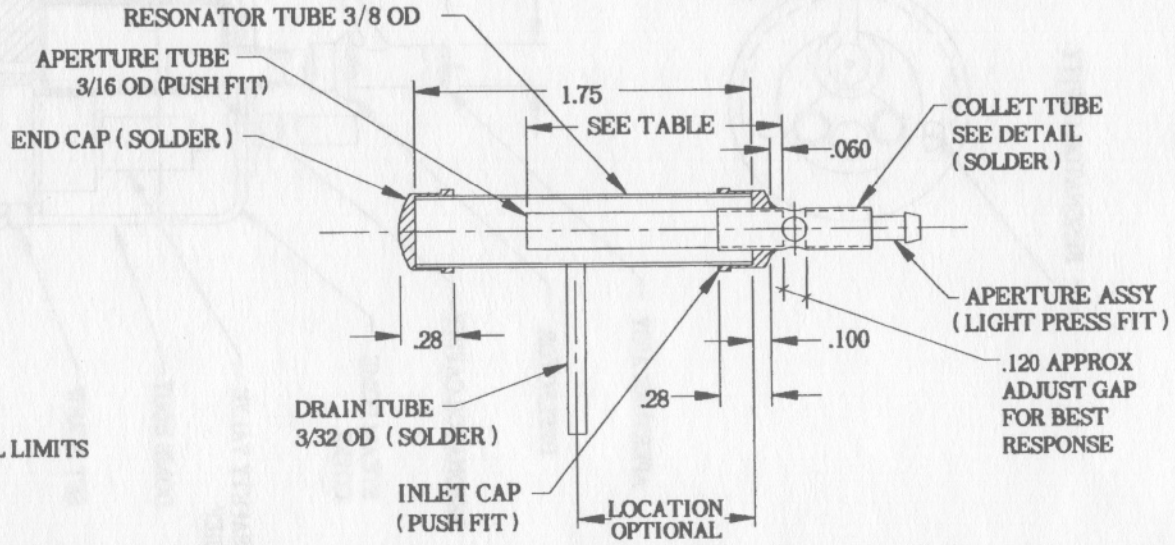
SUPPLY TUBE	
HARMONIC	LENGTH
1ST	OMIT SUPPLY TUBE
2ND	.437
3RD	.875
4TH	1.312



APERTURE ASSEMBLY SCALE : 2/1



DETAIL COLLET TUBE SCALE: 2/1
7/32 OD



NOTE :

1. TIN JOINTS WITH SOLDER AS REQUIRED AND MACHINE TO NOTED FIT
2. ALL MATERIAL IS BRASS
3. ASSEMBLY TO BE CO-AXIAL WITHIN PRACTICAL LIMITS
4. TUBE ENDS TO BE NORMAL TO AXIS
5. SYMBOLS PER ANSI Y 14.5M-1982
6. DIMENSIONS ARE IN INCHES
7. ALL TUBING IS .015 NOMINAL WALL THICKNESS
8. DIMENSION IS BASED UPON AN APERTURE SLEEVE ID OF .161 CHECK TUBING AND ALLOW FOR AN ANNULAR GAP OF .0063 TO .0065
9. DRAIN TUBE TO BE NEAR FLUSH TO INSIDE OF CHIME TUBE

HARMONIC STEAM WHISTLE

MAXWELL HEMMENS
PORTER

L. BANGHAM 1-28-97

SCALE : 1/1 & NOTED

FIG. 2

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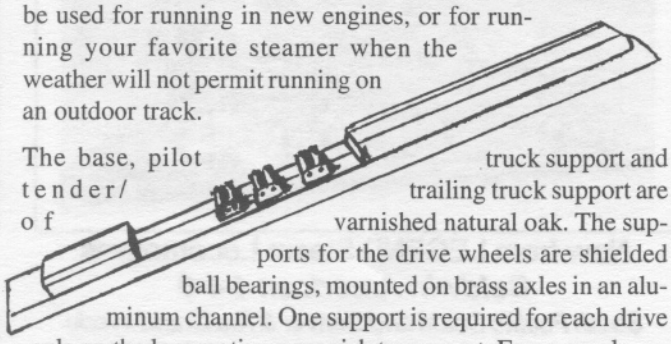

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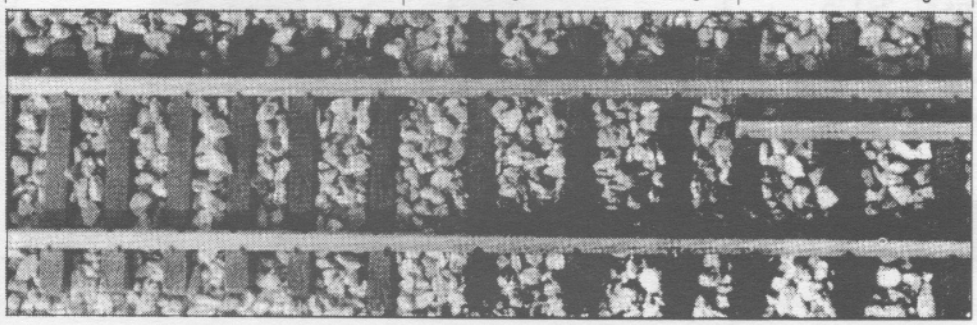

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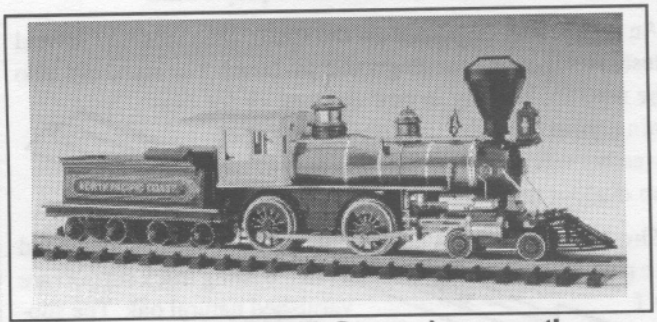

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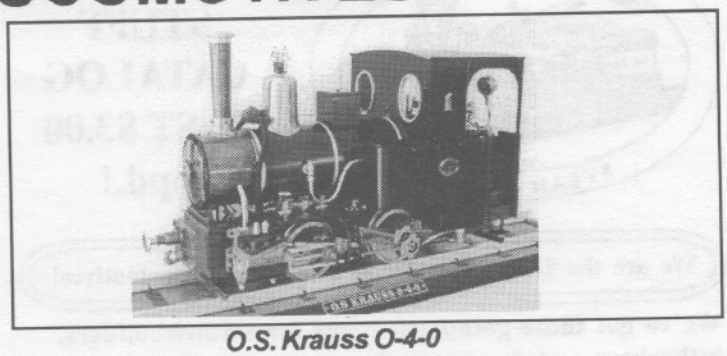

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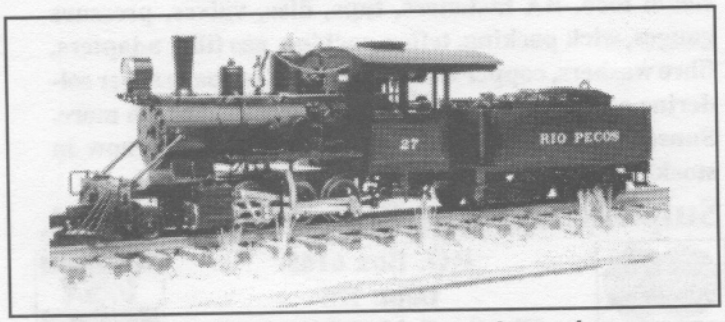

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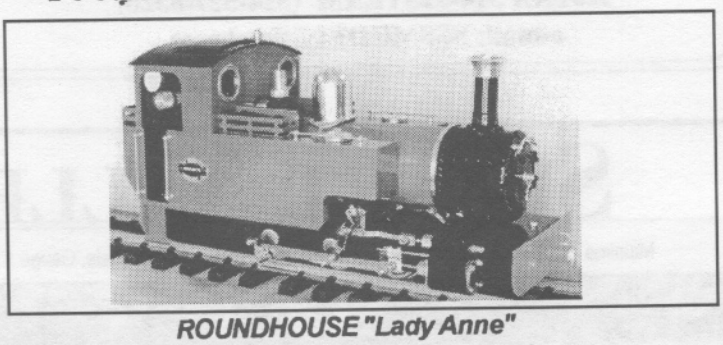

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A Mock deWinton

by Rob Kuhlman
all photos by the author

Rob continues his search for the perfect low-budget steamer

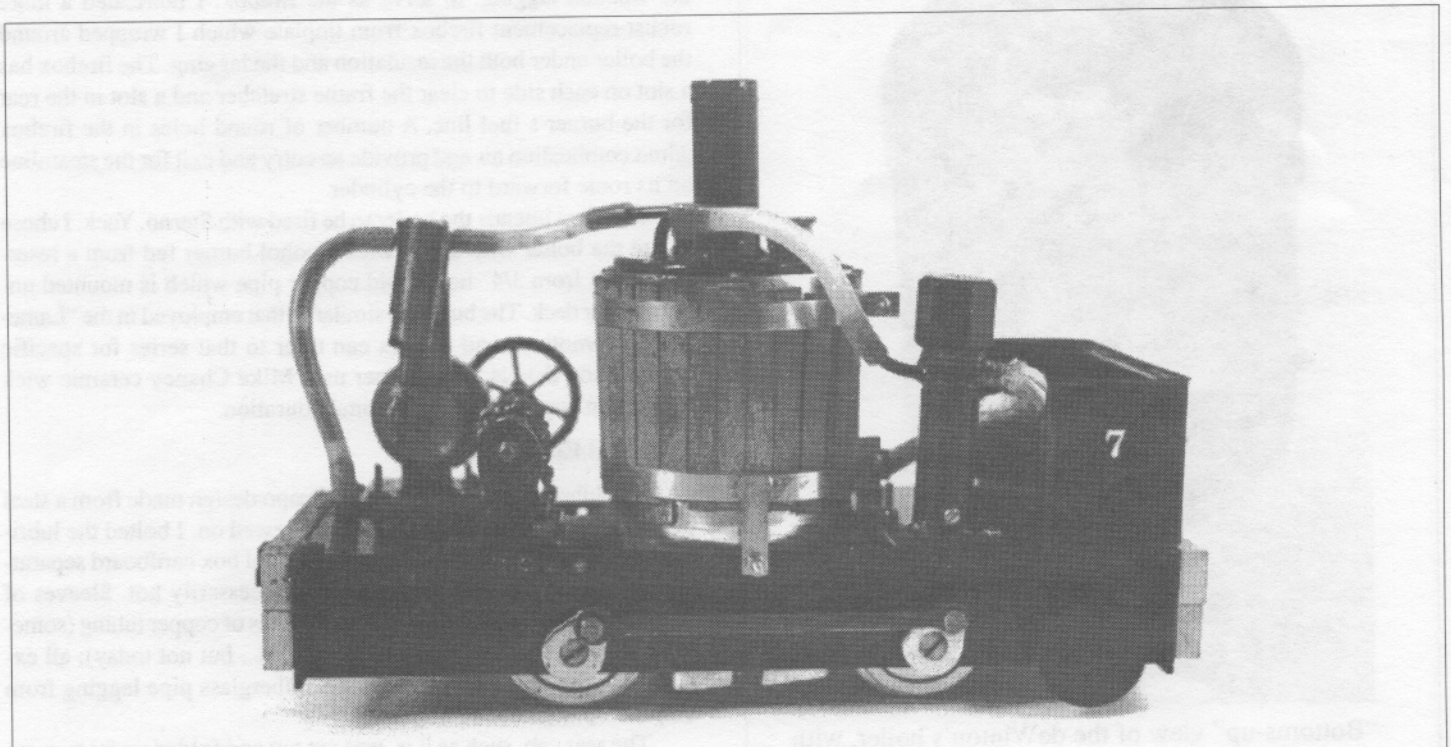
For several years I've been attracted to the Welsh deWinton loco design. To my knowledge none of the prototype were ever exported from Wales to North America, though I'm confident some mechanic at a quarry, logging, or portage railway somewhere over here surely must have cobbled a locomotive very much akin to the official deWinton from materials near at hand. This was the approach that I used — materials near at hand, or at least easily obtainable. Prototype aficionados will note that my model doesn't do justice to the true deWinton design; I sense my loco is too long, its driver's cab is too low, the cylinder assembly is too tall, and the lubricator is far too prominent. Perhaps someday I'll make a true scale model, but for now, I've got a friendly little squat four-coupled vertical-boilered lokie which putters around my track making a steamy fuss.

Readers who remember my loco construction articles in past *SitGs* will recall my obsession with "doing it on the cheap." I never kept careful records of expenditures, but I doubt that I have much more than $100 tied up in this engine. The vertical boiler and single acting oscillator came from a Midwest Model VI steamboat application kit which was gathering dust on a shelf in a local hobby shop. I offered the proprietor $50 and he accepted. The four wheels, the axles and their bushings, and the self-quartering crank arms are all Roundhouse parts. Nearly everything else was cobbled together from stuff lying around my workbench.

Rather than provide a detailed construction account of my mock deWinton, I'll just highlight specific features of its construction. For readers in search of "low-tech and cheap" construction techniques, I'll refer them to the "Lathe-free Locomotive" articles which ran serially in *SitG* during 1995.

Boiler:

The Midwest instruction booklet takes the builder through the fabrication of the boiler with clarity and confidence. As long as the mating surfaces are clean and properly fluxed, success is assured. Make sure you use silver-bearing solder rather than soft solder. The boiler as designed lacks a safety valve, so I drilled a hole in the top to receive a bushing and its valve, designed for the Mamod, which I ordered from Robert Cloke/Mike Chaney. On the boiler bottom I drilled 16 holes to receive porcupine quills. These quills are 1" long pieces of copper wire obtained from scraps of 115 volt household wiring conduit. They are soldered on with 3/4" projecting into the boiler and 1/4" protruding out. I also cut the exhaust stack shorter so it extends only 1.5/8" above the boiler top. A J-shaped piece of 1/8"



Ol' No 7, the author's deWinton, fresh from the shops and ready for revenue service!

copper steam pipe tubing was soldered into a hole in the chimney so exhaust steam could assist the burner's draft.

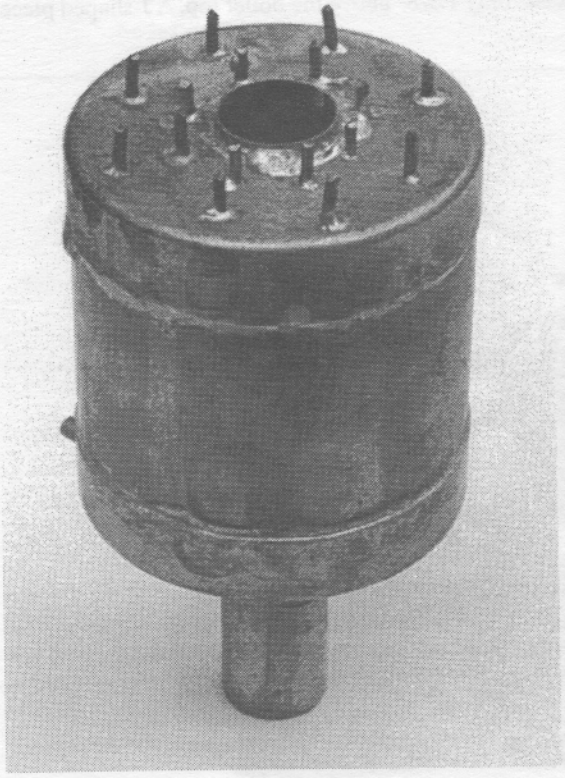
Cylinder:

This assembly was also fabricated according to Midwest's directions with one or two modifications. I recently obtained a Taig microlathe, so I chucked the piston and turned several oil-retaining grooves on the piston's surface. This step could also be done on a drill press or dispensed with altogether. Also, the piston rod drives a brass disk mounted on a brass shaft which, in turn, passes through the cylinder support to the flywheel. I was concerned that the recommended CA adhesive holding the brass disk to the flywheel shaft wouldn't suffice, so I drilled a 1/16" hole through the edge of the shaft and its mated disk and pressed in a piece of 1/16" brass rod to serve as a key.

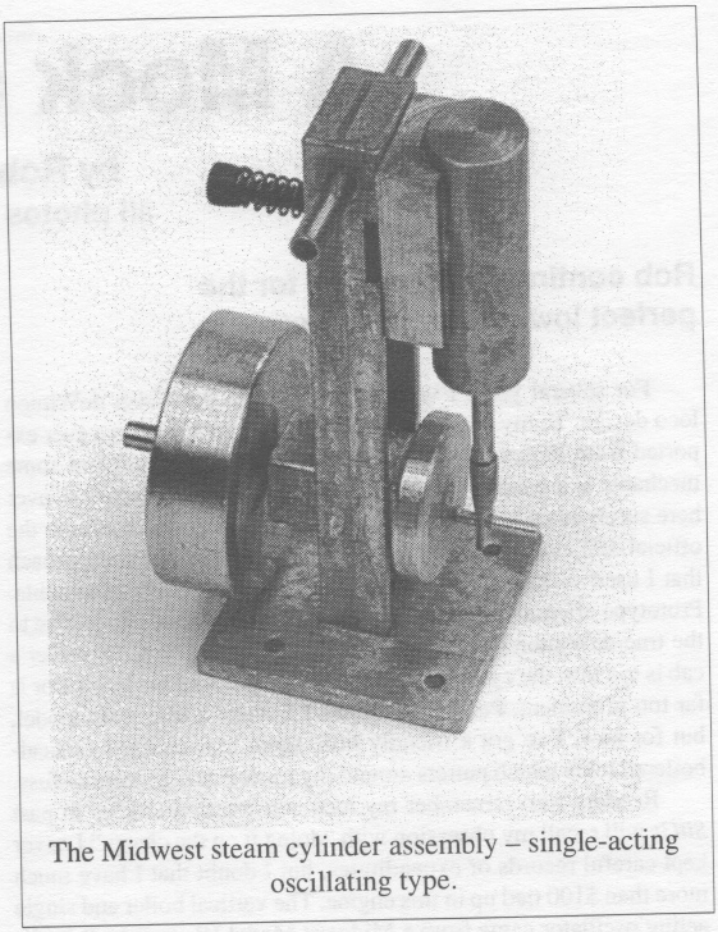
Chassis:

The frame and decking plate pieces were hacksawed and filed from 1/16" sheet steel, and the various pieces were bolted together with lengths of 1/4" brass angle and innumerable 2-56 brass hexhead bolts. The sideframes were positioned sufficiently far apart to enable the firebox to nestle down between them and also to enable my 0 gauge wheelsets to be widened to 45mm in order to run on friends' "broad gauge" trackwork. Be careful that the sideframes aren't too far apart or the cranks won't mount on the ends of the axles. (For some reason I always need to discover the obvious for myself!)

For the transmission I used Serv-O-Link's delrin sprockets and chain from the flywheel shaft to the countershaft and Chicago Gear Works' bronze sprockets and steel ladder chain from the countershaft down to the forward axle. Siderods were hacksawed and filed from 1/16" steel.



"Bottoms-up" view of the deWinton's boiler, with porcupine quills prominently displayed.



The Midwest steam cylinder assembly – single-acting oscillating type.

Firebox and Burner:

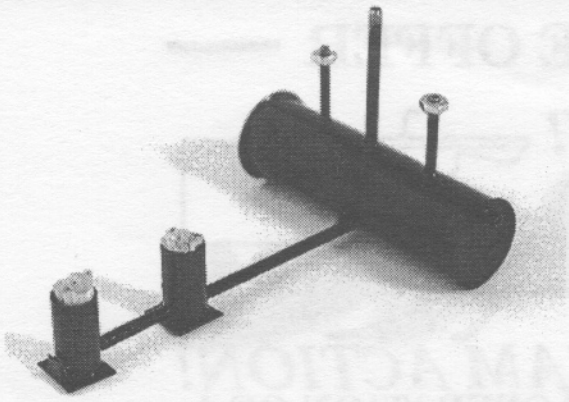
Midwest provides some shim-thickness brass sheet, to be wrapped around the boiler over the fiberglass insulation but under the wooden lagging, to serve as the firebox. I fabricated a more robust replacement firebox from tinplate which I wrapped around the boiler under both the insulation and the lagging. The firebox has a slot on each side to clear the frame stretcher and a slot in the rear for the burner's fuel line. A number of round holes in the firebox admit combustion air and provide an entry and exit for the steamline on its route forward to the cylinder.

Midwest intends the boiler to be fired with Sterno. Yuck. I chose to fire the boiler with a two-wick alcohol burner fed from a reservoir made from 3/4" household copper pipe which is mounted under the rear deck. The burner is similar to that employed in the "Lathe-free Locomotive" and readers can refer to that series for specific construction details. This burner uses Mike Chaney ceramic wick and has an approximately 15 minute duration.

Odds and Ends:

The lubricator is my typical el cheapo design made from a steel plumbing nipple with a steel endcap screwed on. I bolted the lubricator to the rear deck with a square of cereal box cardboard separating the two so the deck doesn't get unnecessarily hot. Sleeves of silicon tubing were used to connect all pieces of copper tubing (someday I'll get around to using proper unions... but not today); all exposed copper pipe was insulated with fiberglass pipe lagging from Sulphur Springs Steam Models.

The rear cab, such as it is, was cut out and folded up from camp stove fuel can tinplate. Stiffeners of brass angle stock were soldered



Alcohol tank and 2-wick burner assembly.

stove fuel can tinplate. Stiffeners of brass angle stock were soldered on the inside and beading soldered around the edge was obtained from electric train hookup wire with its plastic insulation stripped off— finally, a use for the stuff!

I'd never fired a vertical boiler before and feared for the efficient drafting of the burner in the firebox during steamup. Too cheap to purchase a proper battery-operated blower, I cobbled a manual "sucker" from an abandoned bicycle frame-pump, silicone tubing, and some brass tubing scraps. I used a 6" piece of brass tubing slightly larger in diameter than the stack (actually it was the same diameter but I stretched it a bit by using the reamer on the side of my copper pipe cutter as a mandrel). Into this tube I soldered a J-shaped piece of 1/8" copper steam pipe. Gentle pumping of the pump induces a zealous draft in the firebox. Just remember to grab the sucker tube with a glove or rag to remove it from the stack after steamup (yet another one of those maxims I needed to discover for myself..).

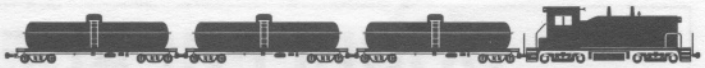
Early on I was having a problem with the initial discharge of condensate and steam oil dripping back down the stack and ending up in the wicks, so I made another J-shaped pipe to fit over the steam exhaust line inside the stack to direct the discharge out and to the side until the cylinder has cleared its lungs. Once the lokie is underway, the J-pipe is removed so the exhaust can properly induce the draft.

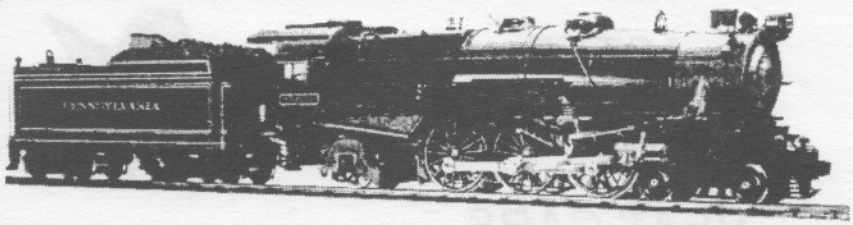
Conclusion:

One of the drawbacks of the cheap single-acting oscillator tram engines which I like to build is that most of them aren't reversible. In the mock deWinton's case it only goes backward — a vertical-boilered cab forward?! The next step is to build a rotary reversing block for the steam lines, but I gather that this requires a lathe. Did I already mention that I recently acquired a Taig? I think this will be my first lathe project.

Finally, if any reader has an interest in giving the construction of this lokie a try, feel free to contact me, via our "esteamed" editor, and I'd be happy to provide more specific construction details.

"Compressed Air" loco at work on the Weedwood. Must be shaken frequently!





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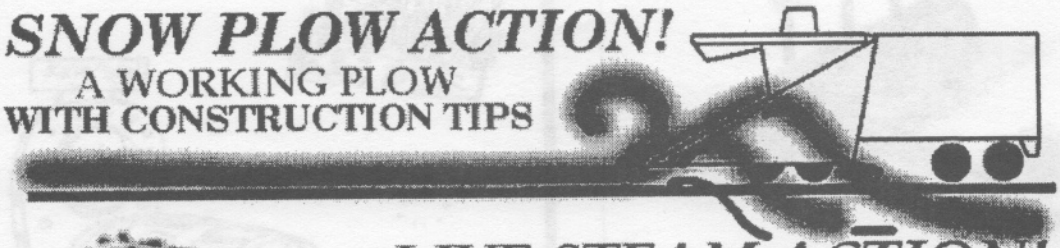

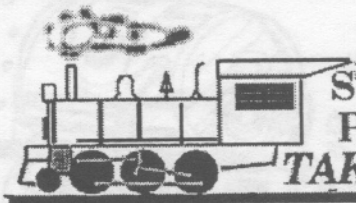

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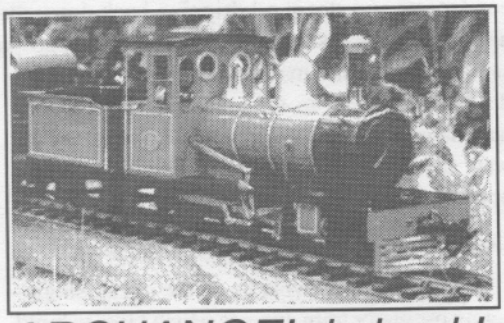

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Product Review – Darex "Drill Doctor" Drill Bit Sharpener

by Ricky Morningstar

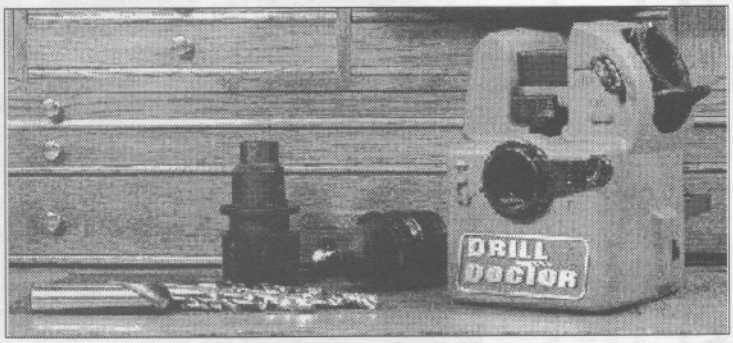
SPECIFICATIONS:

Sharpens drill sizes from 3/32" up to 3/4" (Professional model #750), drill sizes from 1/2" up to 3/4" (model #500). Sharpens metric, number and letter sizes. Sharpens HSS, cobalt, and carbide bits, 135 degree and 118 degree points, conventional points, split points, masonry and parabolic points. Sharpening time 30-90 seconds, depending on drill size.

About the size of an electric can opener. Six foot long cord, UL approved, Double insulated, 120 volts. 22,000 rpm, 3.0 amp motor. Impact resistant plastic case. Comes with a diamond wheel, MADE in the USA by Darex. Wheel replacement cost, $30.00. Includes a 58 page text book on drilling and drill bits and a 40 minute video.

Available from: T.Q.M. Company, PO Box 663, Talent OR 97540 - phone 541-482-6583 or Fax 541-482-6304.

Our editor sure knows how to bring happiness to the Poorboy Railroad's workshop! When he asked me to do a review of the new Darex Model 750SP Drill Doctor, I said I would enjoy doing so. I had in the back of my mind the Darex M5 Drill Sharpener *(reviewed in SitG, issue Nº 24)* that I have used many times, and I felt that there was no way that Darex could produce an intermediate drill bit sharpener with the high standards of the original. Boy, did I ever get a welcome surprise when I opened up the carton and inspected this compact machine that will fit in any hobbyists machine shop, garage, etc. without stealing a lot of precious and valuable bench space.



The Darex Drill Doctor Professional Model 750 comes with a 3/32" to 1/2" chuck, and a 1/2" to 3/4" chuck. The left front port receives the chuck first. Insert the chuck until it nests in the notch, open a set of visible jaws with a small lever, insert the drill bit through the chuck, turn it a bit until you feel it nestle into the jaws, then release the jaws and tighten up the chuck on the drill bit. Check to make sure the bit is still bottomed on the stop behind the jaws. Remove the chuck with the bit chucked firmly in place. (it takes longer to write about this process than to actually do it!) Now for the good part.

Turn on the slide-type off-on switch, insert the chuck with bit and rotate slowly in the right port. You will feel the chuck move over a cam surface and will hear the diamond wheel dressing one side of the bit. Keep turning and the other side will make contact. I find that by rotating slowly, with soft steady pressure, the bit comes out without any burrs and is almost cold. This last is important to keep the temper in the bit.

Check the bit, and if you are satisfied you can really get the adrenaline pumping by inserting the chuck – with drill bit still firmly mounted – into port 3 which (you guessed it) will give you a split point bit. It's just a matter of inserting the chuck and you will feel it nestle into a notch. Then move the chuck sideways and you will hear the grinding wheel doing its job as it engages the bit. I do this 2 or 3 times, then back off the chuck slightly, rotate it 180° and repeat the motion to split the point.

If you aren't familiar with split points, you really should give them a try. They will start a hole where you want it without dancing uncontrollably around the surface to be drilled. A great invention!

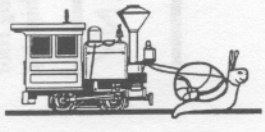
The problem with this machine as I see it is twofold. Whereas in the past you might have showed off your ability and training in sharpening drill bits to your friends and fellow machinists, you now sharpen with the Darex Drill Doctor, which takes all the hard work out of perfect drill bits. No bragging rights here.....anyone can do it! My wife, who is a delightful and talented person, but not mechanically inclined, watched me work with the Drill Doctor for a few minutes and said, "My, even I could do that."

The other thing I find is that (just like with eating potato chips) I cannot sharpen just one drill bit at a time. You can spend hours in the shop playing with the Drill Doctor. One even gets the urge to call up the neighbors to see if they have any dull drill bits laying around.

The Darex Drill Doctor will easily allow you to sharpen 118 degree or 135 degree points by just moving one small lever. You can even sharpen those old dull masonry bits you probably have laying around, as well as carbide and cobalt drill bits.

By the way...I believe that Darex is being too conservative when they say that the smallest bit that can be sharpened with the Drill Doctor is 3/32". I easily sharpened bits down to 1/16" with no problems or complications.

After extensive testing in my own shop, I have found the Darex Drill Doctor to be a big asset to any small shop or workshop, and I recommend it unconditionally.



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* 1931 and modified 1935 version available

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- **Length over buffers:** 620mm
- **Availability:** April 1997
- **Wheels:** steel insulated finescale
- **Finish:** GWR c. 1932, hand lettered
- **Weight:** 2.0 Kg
- **Material:** 95% brass, including roof
- **Price:** £ 950 plus shipping

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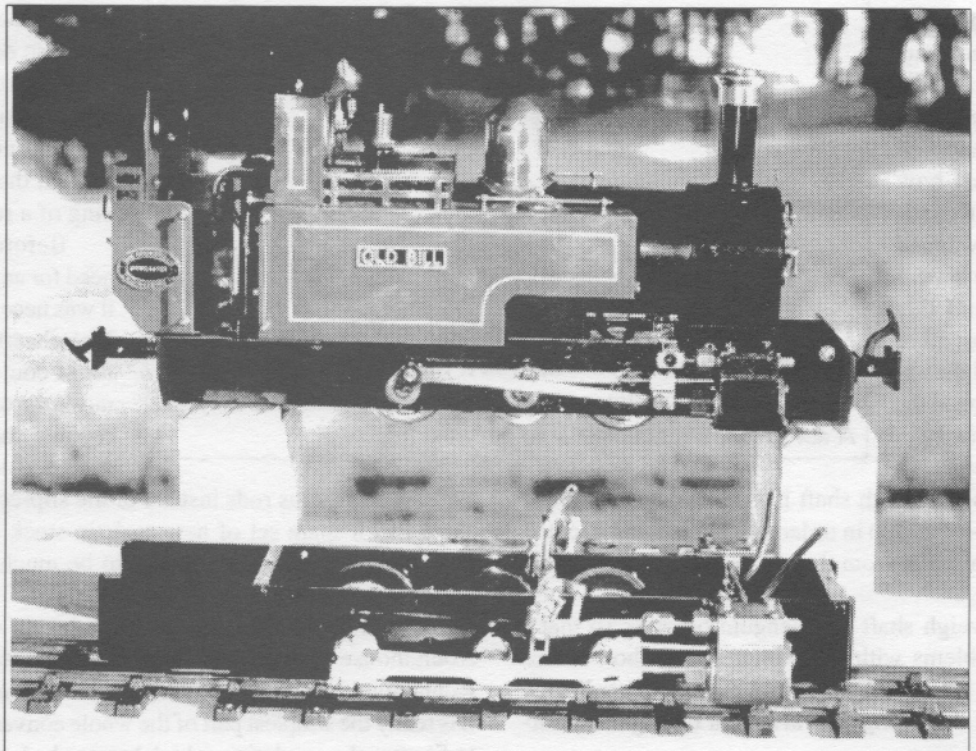
Converting a Roundhouse Lady Anne From Slip Eccentric to Walschaerts Valve Gear

by James Ritson
all photos by the Author

A couple of years ago I decided to purchase a Meths fired Lady Anne, and, finding that Roundhouse had just stopped manufacturing them, I was fortunate to find a secondhand one on offer from Sulphur Springs Steam Models. I already owned two Merlin gas fired locos and thought that the meths fired, slip eccentric loco would provide an interesting alternative. It did. I have found it to be a most relaxing engine to run. With it's 45 minute duration, about half as much again as the butane locos, it is just the perfect locomotive to set off on a journey while sitting back with a mug of tea to watch the trains go by, or do a bit of gardening while it chuffs around the yard.

I typically set a train to run around the circuit in one direction for half of it's run before stopping at the station, running the loco round it's train, and finishing off in the opposite direction. It was this very minor act of switching that started to sow the seeds of discontent. Somehow, when I had to push it in the desired direction to reset the valve gear to back up it just didn't seem like a real locomotive. Too toy like. Faintly reminiscent of childhood days spent with a fun but unrealistic Basset-Lowke Enterprise.

Now the previous Christmas I had decided that I was getting sufficiently confident with little steam engines to have a go at building a gas-fired Lady Anne from the self-assembly kits available. These locomotive kits come in four parts, the first of which is the chassis kit with Walschaerts valve gear. Once I had assembled it I found myself comparing it with the meths-fired, slip-eccentric loco and wondering whether I could fit the Walschaerts valve gear under the excellent meths-fired boiler. The notes in the catalog said that you couldn't readily fit the Walschaerts valve gear chassis with the meths boiler because the meths burner fouled the valve gear. Yet the more I compared the two chassis the fewer the problems I could foresee and after some encouraging words from Richard Finlayson I decided to take the plunge.



A comparison of the slip-eccentric locomotive on the blocks with a Walschaerts valve geared chassis below. Note the different brass blocks at the ends of the valve spindles

Parts & Tools

The Walschaerts valve gear linkage comes complete from Roundhouse as part Nº 402. You will also need two later type valve spindles, part Nº 949. Allen wrenches size 1/16" and .050"AF are needed to loosen the wheels and stop collars. A set of BA wrenches is mighty useful too.

The Conversion

I began by unclipping the cab rear, removing the lubricator, pressure gauge, cab roof, blowdown pipe (not always fitted) and the meths tank and burner assembly.

NOTE: I usually refill the boiler and displacement lubricator at the end of each run before putting the loco away. As a result I ended up with water and oil all over the place. A little forward planning would have made things a lot tidier!

Next I unscrewed the four screws that hold on

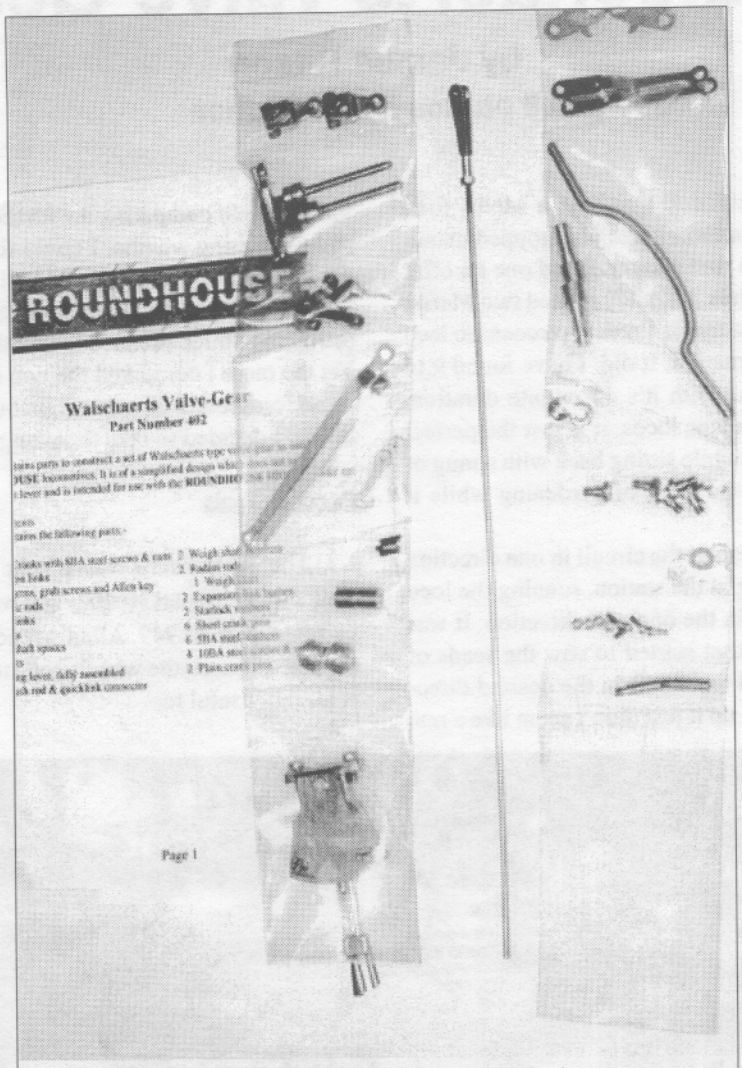
the bodywork, followed by the front buffer beam. Then I removed two screws and loosened two others to remove the smokebox, and pulled off the blast pipe. The boiler comes off with a single screw at each end.

My firebox had an extra plate on the bottom at the front, fastened with what looked like a Meccano screw, so it may have been a homemade job and may not be fitted to all models. I uncoupled the valve connecting rods at the rocker end so that I was able to pull the firebox off in one piece as it is rather a fiddle to get at the Meccano nut in situ.

Next I removed the side-rods, loosened the rear wheels with the 1/16" Allen wrench and the stop collars for the slip eccentrics with the .050"AF Allen wrench. This allowed me to slide out the rear axle, whence I discarded the slip eccentric parts.

Since I don't like non-flanged driving wheels (for purely cosmetic reasons), I also took the opportunity to remove the center axle and replaced the flangeless wheels with standard flanged ones.

When I examined the condition of the rear axle I was quite shocked at how worn it was where it runs in the bearings. There had been no indication at all of any wear when it was running, which I suppose is a good indication of how well (over) engineered Roundhouse products are. I swapped the rear axle with the newer looking center axle and this seemed to take up almost all of the slack. I then refitted the axles and cranks and regauged the wheels for my 32mm track.



This is what comes in the Roundhouse Walschaerts set, part № 402. In addition you will need a 1/16" Allen key, .050" AF Allen key and two later types of valve spindles, part № 949. A set of BA wrenches is also very useful.

The main problem area with this conversion is the weigh shaft interfering with the front burner, boiler and firebox, and so in order to address this I decided to proceed in a different order from that on the Walschaerts information sheet.

I now fitted the weigh shaft and penguin brackets so that I could sort out the problems with the burner and firebox before fitting the valve gear, which is relatively straight forward. This reduced the chances of damaging the valve gear during the modifications.

Oh, and fit the weigh shaft through the second penguin before you bolt it to the frame. I didn't and had to remove it again in order to get the shaft to slide through!

If you have one of the older model Lady Anne's without the holes already drilled in the frames, the instruction sheet comes with further diagrams to show you exactly where they need to be drilled. Extremely thorough, those folks at Roundhouse!

Next I cut out the slots in the firebox to clear the penguins and weigh shaft. On my relatively late model, the outline of the slots had already been etched, but even so the resulting slots weren't quite large enough on my locomotive and I had to file an additional 3mm or so up and forward to get the required clearance. Being made of a thin gauge material, this only took 2-3 minutes. I then tried fitting the burner and to my great surprise found that although the flame from the front burner would heat up the weigh shaft somewhat, they didn't actually foul each other and so I didn't need to modify the burner at all. Perhaps all burners are not identical. I may have been lucky here.

With the firebox and burner in place it can really be appreciated how much extra space there now is between the frames with the slip eccentric gear gone. It would be easy to fit an extra burner between the center frame spacer and the rear axle if one so desired. Later I found that the extra room also made it much easier to get a lighted taper up underneath the boiler to light the wicks at the beginning of a running session.

Before I could check the need for any other modifications it was necessary to assemble the Walschaerts valve gear, but before I could do that I had to remove the old valve spindles and replace them with new ones, designed to connect up to the Walschaerts radius rods instead of the slip-eccentric rockers.

I had a spare set of new seals in stock so I fitted them too, even though there didn't appear to be much wrong with the old ones.

Now I could assemble the Walschaerts valve gear as per the Roundhouse instructions. This might appear complicated, but Roundhouse's instructions are so well written and thought out that it is really the simplest part of the whole conversion. The first things to fit were the crankpins, which have to be Loctited™ in place and peened over on the inside. Then the return cranks were fitted so that they led the crank pins by 90 degrees. There are excellent diagrams throughout to explain all this. The position of the return

cranks is critical, so later they are drilled and pinned as per the instructions.

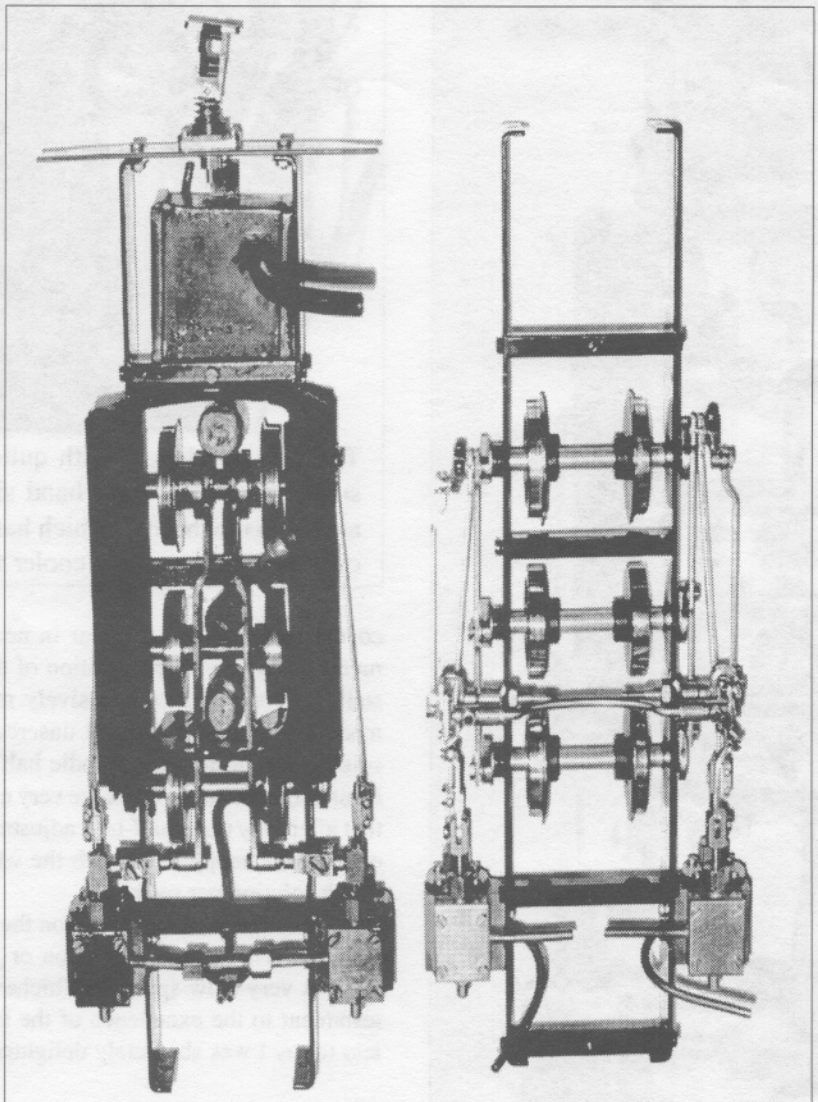
Next I slid the expansion links into their bushes. The instructions said to put a starlock washer on the inside to retain them, but having checked with the other chassis I couldn't see any real need for this. Also, since they would be hanging in the flames under the boiler I cut off the surplus spindle so that they were flush with the bushes.

After this I fitted the eccentric rods and radius rods, all the time checking to make sure that everything would still rotate freely. Finally I fitted the lifting arms and links, one side at a time, making sure that both sides were in neutral at the same time, and that I could get full forward and reverse gears on both sides. Of course I admit that I had previously had the benefit of setting up the valve gear on the chassis kit, but rest assured that by following Roundhouse's instructions this daunting sequence is very straightforward, and not a little satisfying, too.

With the valve gear assembled I could now see how much the weigh shaft swung when setting the gear, and so I could test to see where else it interfered with the other stuff. I found I needed to bend the front of the firebox forward slightly to allow the full swing of the weigh shaft when setting reverse, and it also hit a couple of the porcupine quills underneath the boiler when setting full forward gear. I used a pair of snips to shorten the quills.

The next job was to refit the bodywork and thread the reversing shaft through to the top of the left hand reversing arm. This took quite a lot of trial and error. Having assembled the reversing lever and attached it to the footplate, I attached the rod to the top of the left hand lifting arm and laid the body on the chassis to see how everything lined up. I found that it took several goes to get the rod to line up with the lug on the reversing lever and yet not rub against the firebox or bind on the cabwork. Perhaps I was being too impatient, you might not have much trouble with it.

Once the rod lined up I threaded it through the lug on the reversing lever, set mid-gear at the expansion link with the lever vertical for neutral, and tightened the fixing screw. I checked the operation and was pleased to find that I could get full forward and reverse gears. But to get full forward I had to push the lever a long way forward and it tended to get behind the cab's sidesheet and be awkward to get a finger round to pull back into neutral. So I pulled the lever back into reverse gear, loosened the fixing screw and moved the lever to the rear limit of it's travel and retightened the screw. In this way the lever is tilting slightly to the rear in neutral but doesn't disappear behind the sidesheet in forward gear. I just check that the radius rod is in the middle of the expansion link when setting neutral.



A view of the two chassis with boiler removed, showing the differences in the layout.

Since everything in the cab gets quite hot during operation this has turned out to be a good idea in practice. I have also bent the top of the lever out slightly to make it easier for my stubby fingers to get at it.

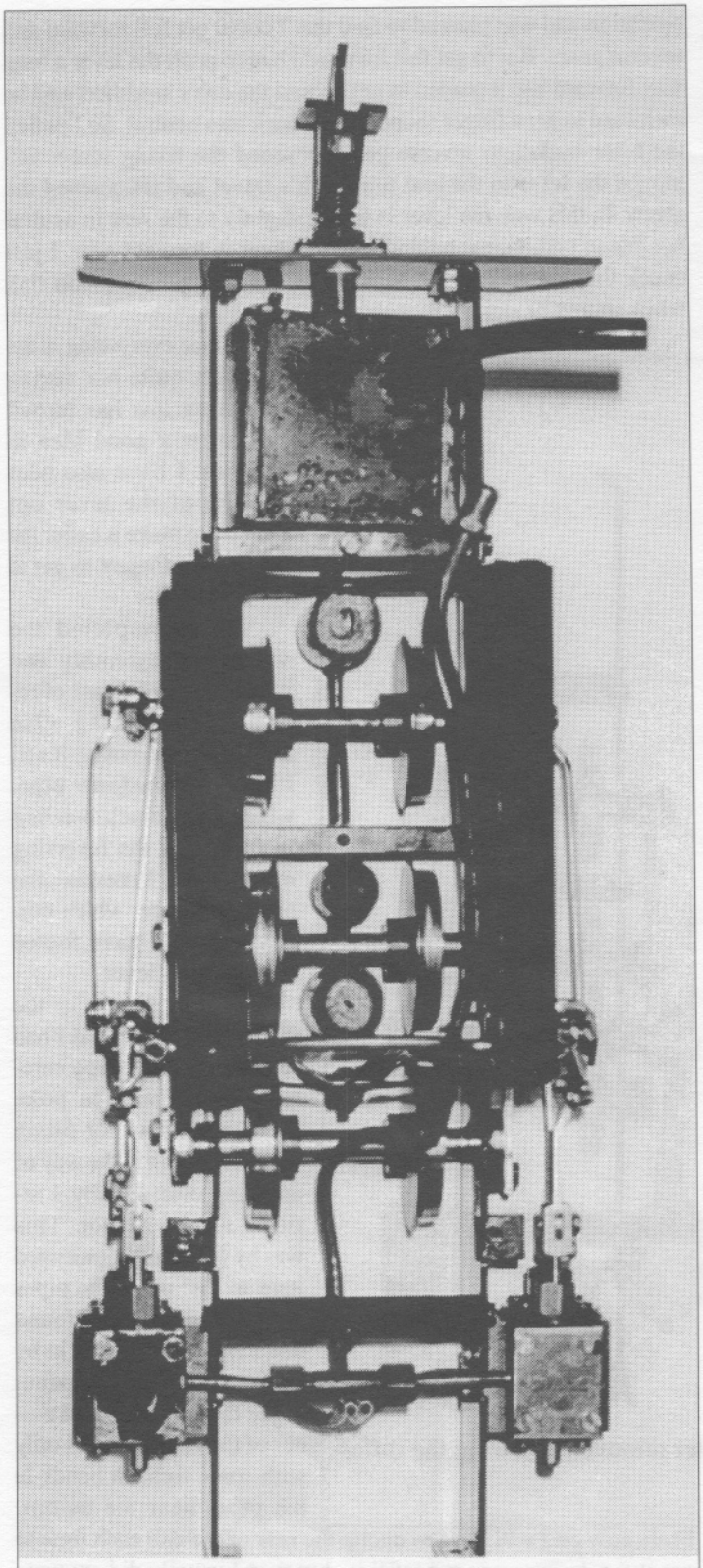
This completed the valve gear assembly and now it was just a case of refitting everything else around the reversing lever. First the blowdown pipe, which took much bending to fit around the reversing mechanism. Likewise the pressure gauge, which otherwise would have fouled the reversing lever.

Next I offered up the meths tank and found I had to bend the filler pipe carefully to allow it to poke through the door for filling without getting in the way of anything else. Finally I refitted the lubricator. This was by far the most awkward item to line up as the pipes are quite short and I found that I could only get it in by having the drain screw pointing at the rear left hand corner of the cab, and then only with some tightish bends in the pipes near the unions. From now on I will have to unclip the rear of the cab each time to get at the drain screw and refill it...but then I usually did anyway.

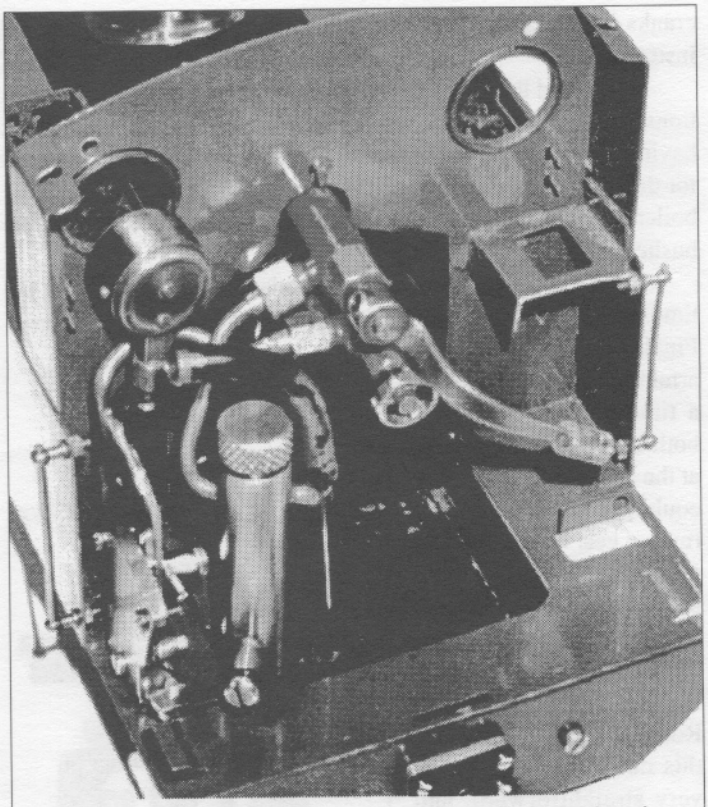
Tune-up Time

For the first tuning session I ran the loco on blocks and was slightly nervous about getting it all running right. I needn't have worried. Once again Roundhouse's instructions made it all very clear and simple.

First you set the valves in mid position by eye, with the valve



The slip eccentric valve gear has been replaced by Walschaerts, and the firebox modified to fit (although you can't see that from above). There is now more space between the wheels, and this makes the wicks much easier to light.



The new cab layout with quite a lot of plumbing in a small space. The right hand side is still clear for easy access to the throttle, which has a piece of plastic tubing over the end to make it cooler to the touch.

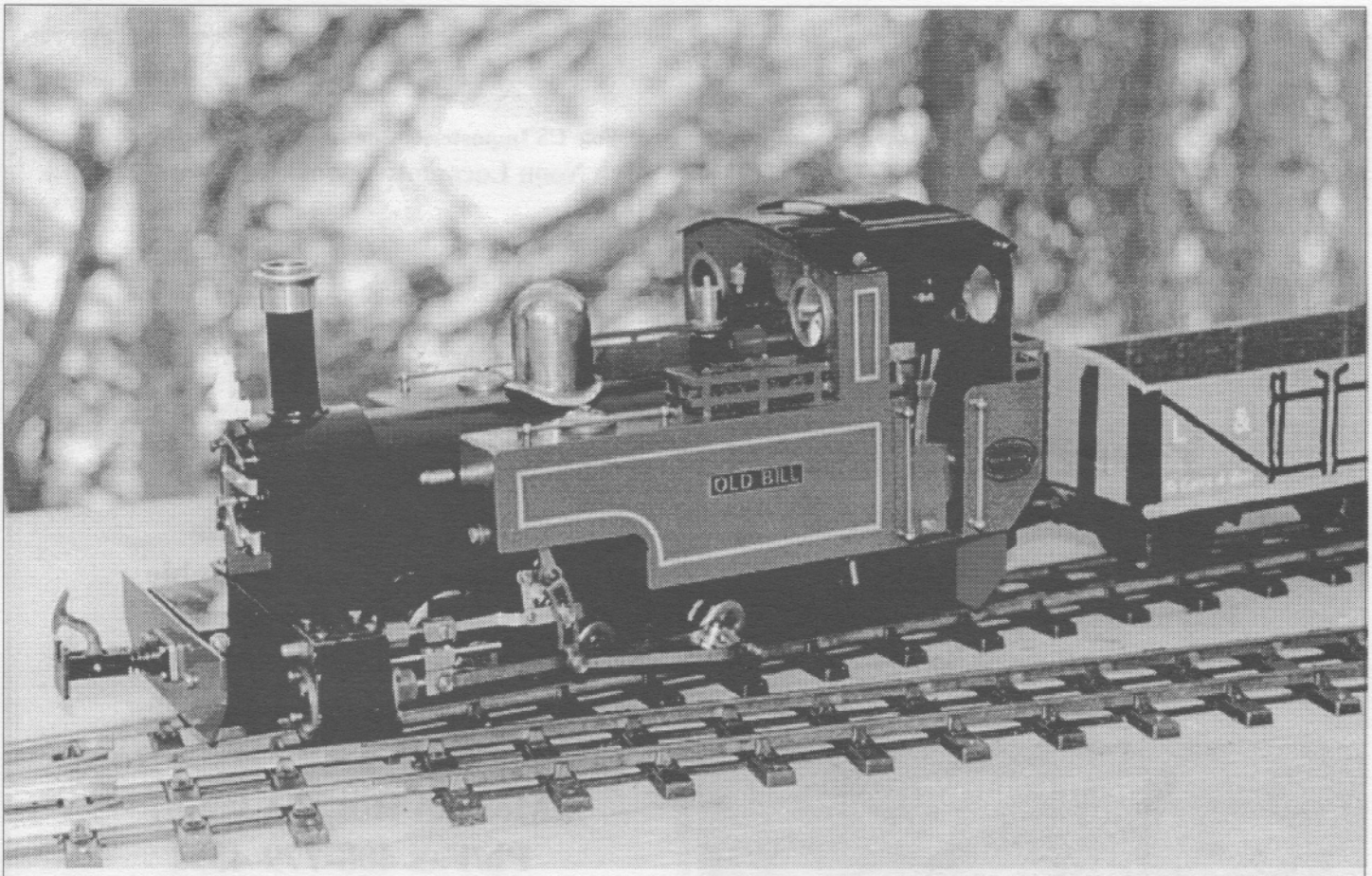
covers removed and the gear in neutral. Then you make adjustments according to the position of the rods when the locomotive stalls as you run it progressively more slowly. Adjustments are made one side at a time by unscrewing the radius rod from the spindle and turning the spindle half a turn at a time. Once again Roundhouse's instructions are very easy to understand, and I found that after only three half-turn adjustments on the left hand side, the engine was happy to sit with the wheels turning slowly at about one revolution per second.

I then put the locomotive on the track and set it off at a crawl. It did so without any hesitation or jerkiness, chuffing round the track at very slow speed in whichever direction I chose. A great testament to the excellence of the Roundhouse designers. Needless to say I was absolutely delighted, and still am.

Final Thoughts

This is really a very simple conversion and I am glad that I carried it out. The only difficulty I can foresee would be if one wanted to fit radio control, in which case one would have to be quite clever to find places for all the equipment. With the burner and fuel tank taking up so much space between the frames, I suspect that hiding batteries and receiver in an extended rear coal bunker might be the way to go.

For some of us the aroma of methylated spirits, or denatured alcohol, is one of the most evocative smells associated with garden railways. This engine has a character quite different from it's radio controlled, gas-fired shed-mates. It is a much more relaxing



Back in service and switching coal empties in the Alaskan winter. A thoroughly enjoyable experience, if a little cold at times.

loco to run, and although the radio controlled models are terrific for running a hectic timetable with lots of switching and stopping at stations, the pleasure of a hands on, manually controlled loco is complementary to that. Perhaps a little more intimate.....good for when the mood takes us to be an engineer with his iron horse, rather than manager running a bustling railway with lots of yard work and a timetable to keep to. Now that I can switch with it as per the prototype, it provides another fascinating aspect to this most absorbing of hobbies.

It's a lot of fun having a unique engine too. Try it!

Roger Loxley of Roundhouse Engineering was kind enough to comment on this article as follows:

The bottom plate held on to the firebox by a Meccano bolt is not a Roundhouse part and would have been fitted by the previous owner for some reason.

You also mention Porcupine quills on the bottom of the boiler; these are also not Roundhouse items. Our pot boilers were plain.

The marked cutouts on the firebox etches for the weigh shaft brackets were put there for the original Walschaerts valve gear, which was slightly different. It was intended to produce a Walschaerts/Meths-fired Lady Anne and the firebox was made to accomodate both this and the slip eccentric version, but it never came to be. Subsequently, the Walschaerts was altered as you found.

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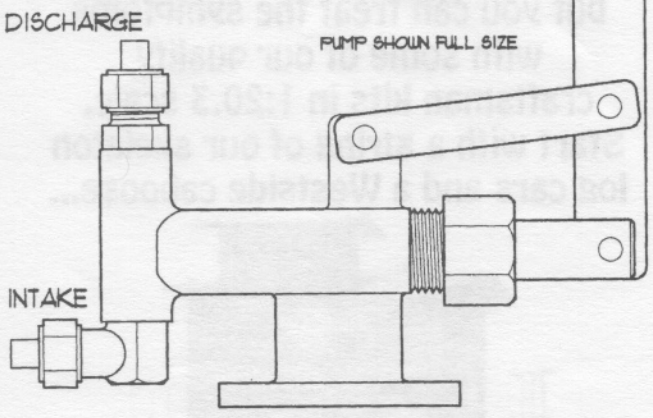

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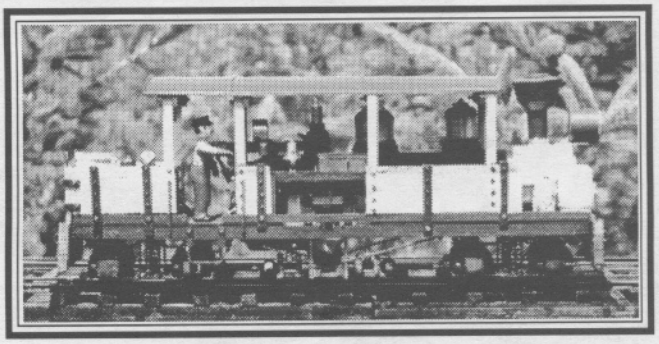

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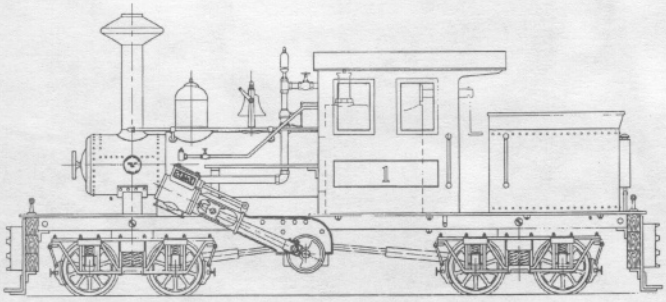

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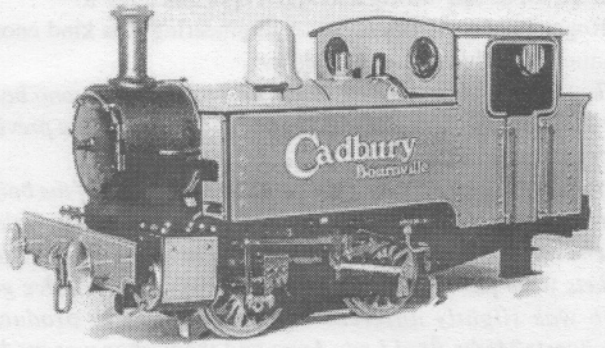

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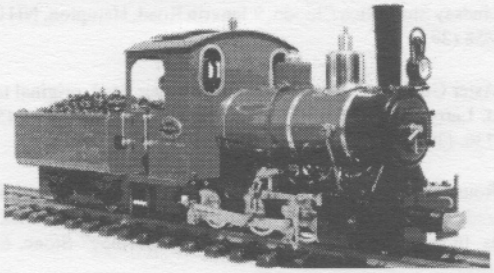

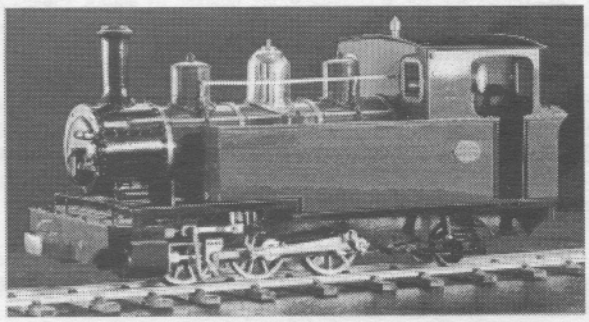

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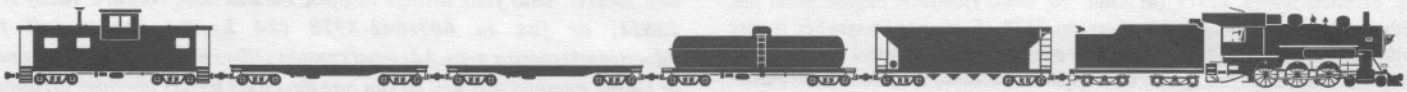

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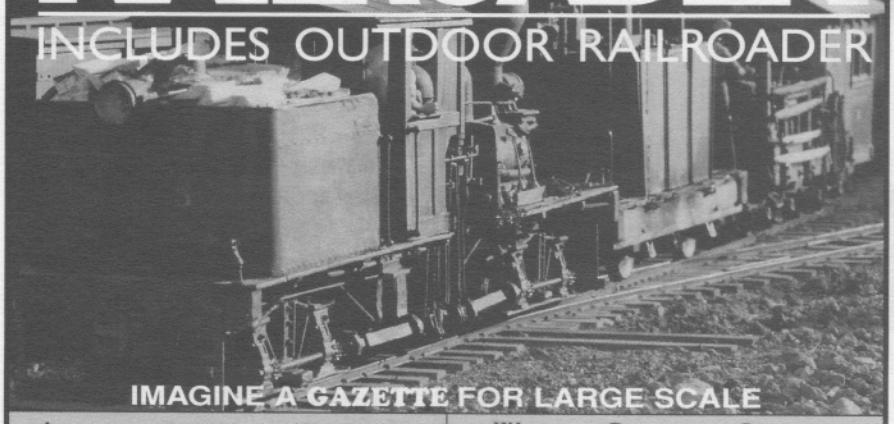

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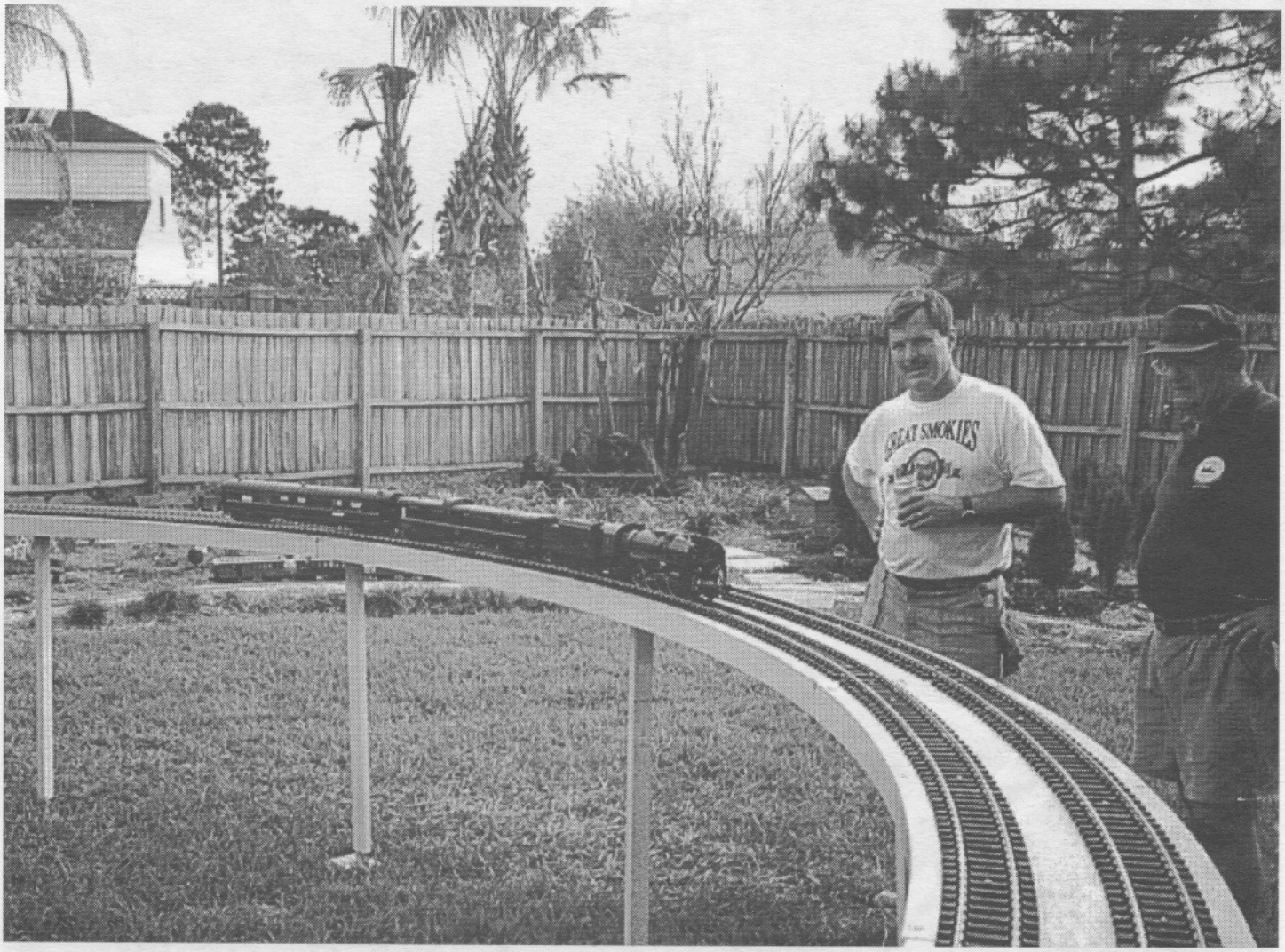
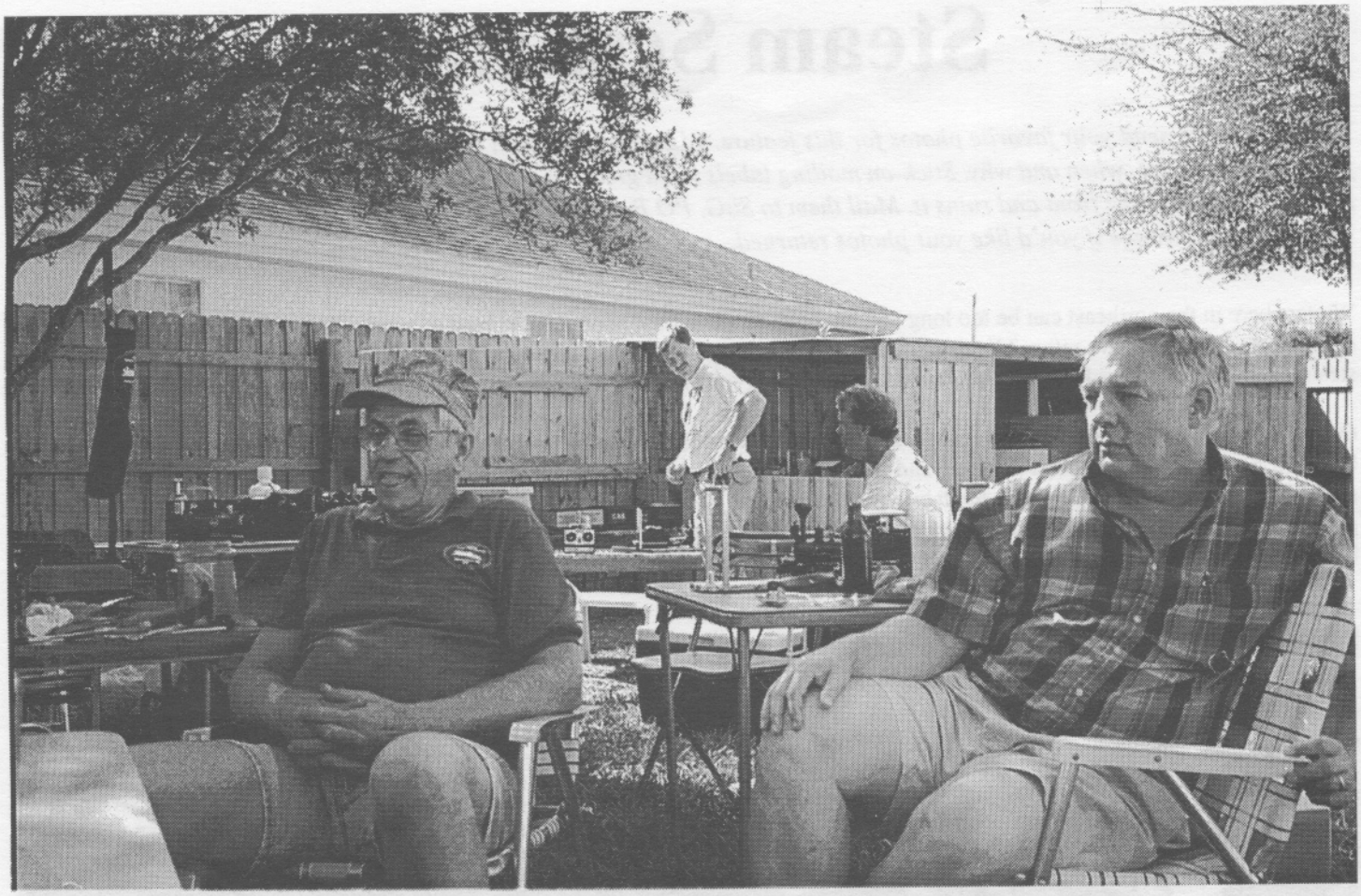
Winters here in the northeast can be too long and too cold, so when the opportunity to head to sunny Florida for a few weeks of respite came along, how could we refuse? Faithful Assistant and I enjoyed ourselves immensely as we were treated royally by the small-scale steam community in Florida. What could be better in February than sunshine, warm days, fresh squeezed orange juice and steam?

One of our memorable weekends was spent at Bill & Pat Chamberlain's beautiful home in central Florida. Bill organized a steamup when he heard we were going to be in the area, and a sizeable contingent of Florida steamers showed up for a weekend of camaraderie and steam trains. Walt Swartz of Istra Metalcraft brought his excellent portable track, which proved to be a fine supplement to Bill Chamberlain's ground level garden railroad. The following photos ***(all by Ray Claxton)*** will give you a peek at what a great time we had with the Florida bunch. To see these photos and lots more in full color, check out our web site at <http://www.steamup.com>.

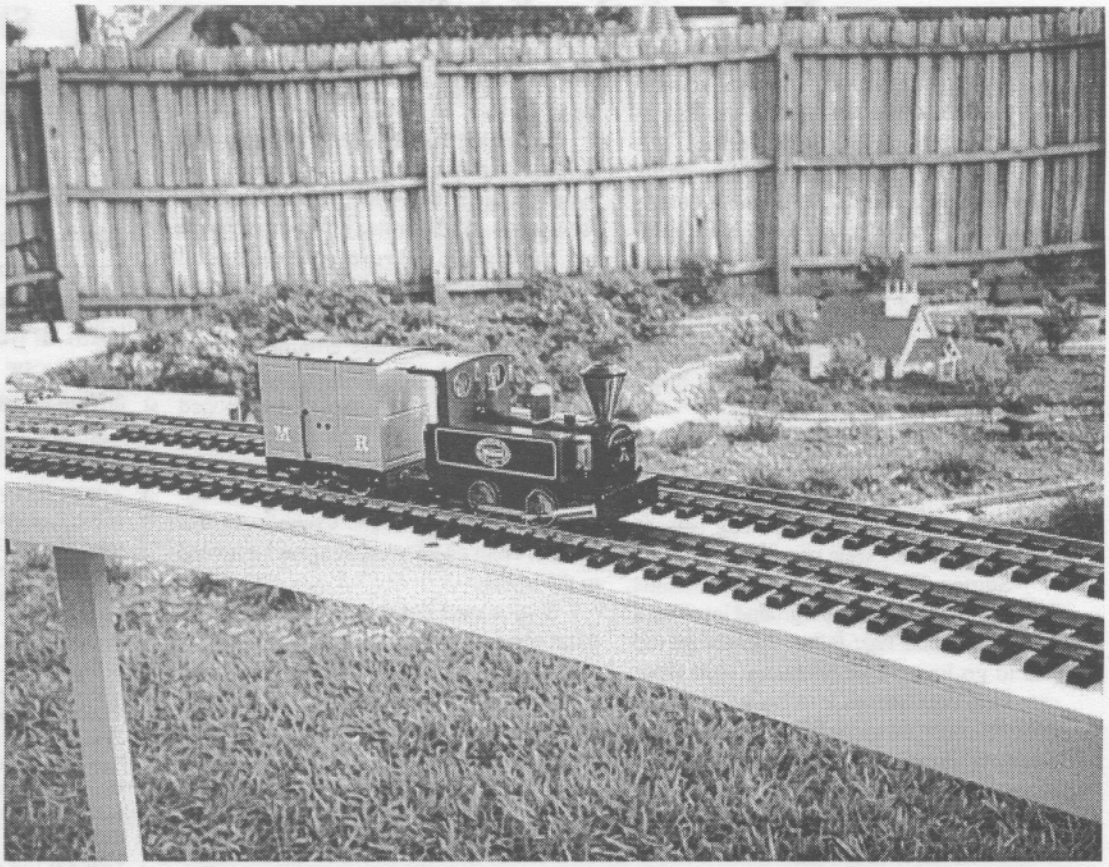


Host Bill Chamberlain (left, above) and Norm Saley exchange comments on the performance of Larry Smith's passing steamer, an Aster 141-R Mikado. The elevated track was built by Walt Swartz, and it was most welcome and heavily used here, as it was at Diamondhead '97. A portion of Bill's L-shaped ground level garden railway can be seen at the rear.



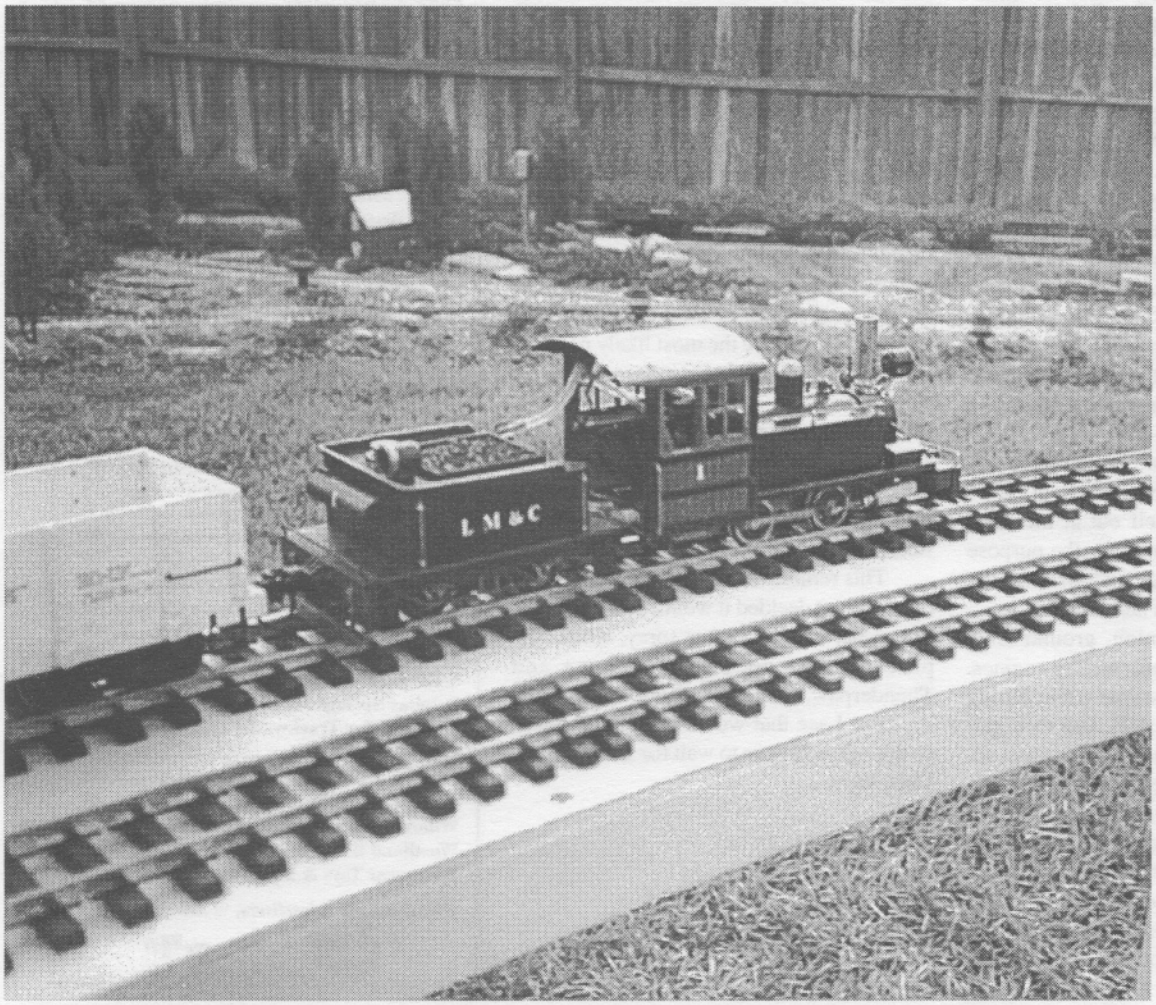
Opposite page, top:

Walt Swartz (left) and Bob Simpson relax in the shade as they watch the steam action on the elevated track. Our host, Bill Chamberlain can be seen standing in the background, and Rob Osterhoudt is seated at one of the loco servicing tables.



Opposite page, bottom:

Larry Smith tends to his Aster 141-R Mikado on the elevated track. The sunshade proved to be a necessity as the temperatures climbed past 90° on this winter day!



This page, top:

Ray Claxton's ubiquitous Mamod, complete with Mamod box van, hauls the freight. There was a nice variety of locos at this steamup, ranging from Asters to Mamods and everything in between. There were also some very nice scratchbuilt engines by Gary Lyons and Norm Saley.

This page, bottom:

Another Mamod, this one highly modified by Norm Saley, takes its turn on the elevated track.

End of the Line

On the ground, or in the air? That's a question that comes up often these days, as the season for building (or rebuilding) outdoor tracks for our steamers is upon us. Many of us began with a ground level line, simply because it was inexpensive, quick and relatively easy. Now, years later, we've had the opportunity to operate our trains on elevated tracks at Diamondhead, Sunnyvale or some other venue, and perhaps we've found that an elevated track is easier on backs, knees and/or other parts of our anatomy.

Some of us are fortunate in having a sloping yard, which allows us to have the best of both worlds. For those of us not so fortunate, we can find compelling reasons for building either style of track.

Some of our own early experiments with various materials on a ground level track here at Paradise East failed. Aluminum rail had to go because of problems with those cute little deer hooves kinking it – steel rail failed because of serious rusting and pitting caused by the passing snowplows burying it in salt-laden snow during the long winter months. After many hours spent wrestling with the pros and cons of ground level versus elevated, we've finally begun our next-generation track construction.

This version will be elevated for a number of reasons, not the least of which is Fang, the dog next door. Fang and I became acquainted as he was hanging by his long, sharp teeth from my upper thigh one summer evening a few years ago, having attacked while Faithful Assistant and I were distracted as we gazed upon the results of a weekend of hard labor in the yard.

Fang doesn't waste any time or energy with a lot of senseless growling, barking and posturing. Reasoning that there's no point in alerting his prey to the impending attack, he moves in silently for the kill.

Once the wounds had healed from that encounter and the memory had dimmed somewhat, I found myself out at the track one lovely summer evening for the purpose of testing a newly arrived Catatonk Shay before shipping it off to its new owner.

In my humble opinion, ground level tracks are less than ideal for testing engines. The position one must assume while getting all those wheels on the rails, and then getting a closeup view of the mechanism in action to be sure it's all in good working order, is not unlike that of a variety of beetle we called "stink bugs".....nose to the ground and posterior pointed skyward. This was the position I was in, having just gotten the Shay fired up and on the rails, when I caught a glimpse of motion out of the corner of my eye. It was Fang, and he was moving in for the kill.

Lightning fast reflexes took over as I hit the dirt and rolled away quickly to gain more footage between the predator and myself (he was still 50' away, but you can't have too much space between your throat and those razor-sharp, glistening fangs). I managed to knock the Shay, burner still hissing cheerfully, off the track completely as I lunged to my feet in wild-eyed panic.

As soon as I got vertical, Fang stopped advancing. Every time I got down to Shay level, he would resume stalking his prey with a stealth and cunning inherited from his ancient ancestor, the wolf. Completely unnerved, I picked up everything and retreated to the house.

I've played out many scenarios in my mind since then, some of the most interesting ones filling the hours between 2 a.m. and daylight. Sadly, in the light of day I can't really see myself in the role of The Terminator, silently moving around the back yard in Green Beret attire and festooned with lethal weaponry. Having a Bengal tiger for a house pet is probably not realistic either, so another solution to the problem had to be found. This is when I decided that an elevated track would be just the thing for our next-generation outdoor railroad.

There are many good reasons for deciding on an elevated track. The stinkbug position lacks dignity, and kneeling on sharp gravel ballast is really hard on the knees. It's also difficult to diagnose problems on little steamers with one's chin resting in the mud or gravel and a dandelion tickling one's nose. But the best reason of all is that a vertical position seems to be the most likely position from which to survive another attack by Fang.

This past weekend my son and I set and leveled the concrete deck blocks that will be the foundation of our elevated track...and I'll soon be adding a can of pepper spray to my steamup tool kit!

This reminds me of the time that Faithful Assistant decided it would be a good idea to test her can of pepper spray, which she proceeded to do...upwind of me and Thunderpaw, our faithful feline companion.

But I see that we've run out of space, so this tale will have to wait for another time. Until then.....

Happy Steaming!

Ron

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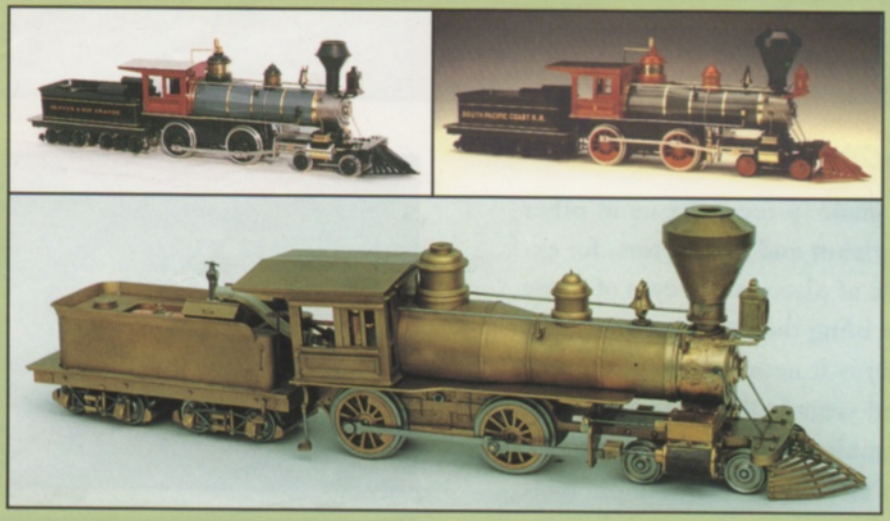

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Nov 7-8

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Notwithstanding the tremendous advances made in recent years in other types of working models - radio-controlled planes and helicopters, for example - the steam locomotive still takes pride of place in the eyes of many model engineers. O.S. live steam locomotives bring the hobby to a new and wider section of model enthusiasts. No longer is it necessary to possess an expensively equipped workshop and to spend years building a steam loco. Parts are ready machined and some sub-assemblies, such as the boiler, are ready built. An O.S. locomotive kit needs no more than a few simple tools and the true enthusiast's careful hand,to produce a superb model that duplicates a fullsize locomotive's operation in every respect' from raising steam to driving and maintenance procedures.

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