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STEAM IN THE GARDEN

In this issue.....

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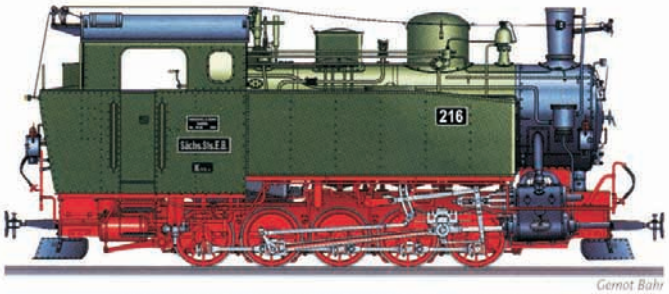

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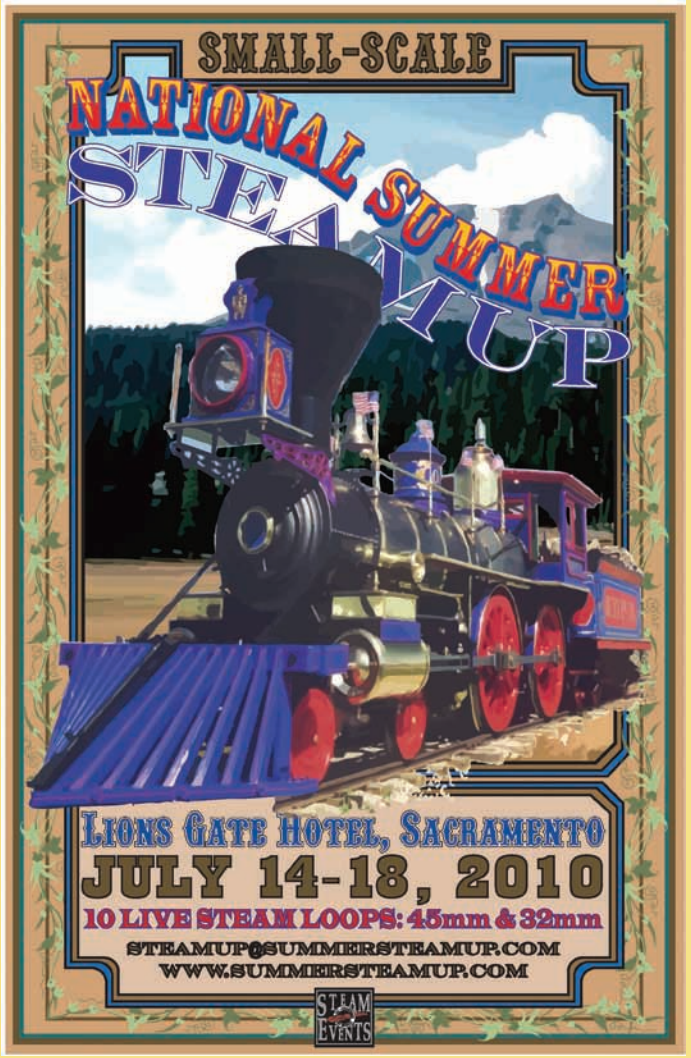

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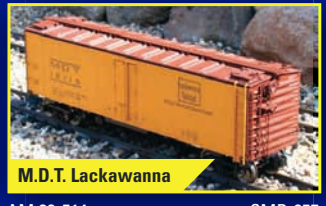
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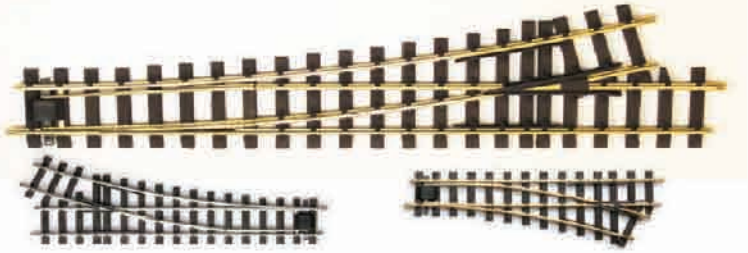

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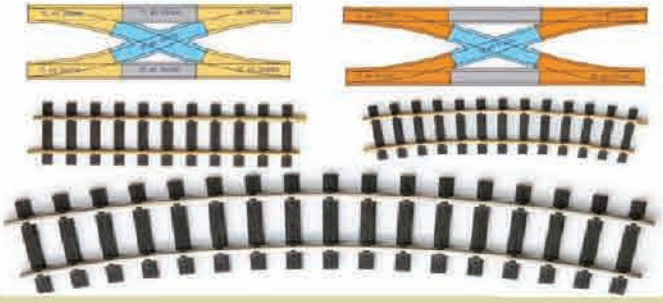

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STEAM IN THE GARDEN

Vol. 20, № 3
Issue № 111

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

Articles

Departments

FRONT COVER:

A live steam Model-T Tin Lizzie Rail Truck returning to home base after its morning run along the mainline. Picture taken at the September SoCal Steamup hosted by Sonny Wizelman. (see a series of articles on scratch building this steam-powered Model-T starting in this issue)

Photo by Howard Maculsay

Editor
Ron Brown

Wonder Woman
Marie Brown

CAD & Other Drawings in This Issue
Dan Rowe, Eric Strauss,
Gerald Pierce, Howard Maculsay

Regular Contributors

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Carl Berg	New York
Paul Blake	Australia
Tom Bowdler	New York
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CALENDAR OF EVENTS

Southern California Steamers - contact Sonny Wizelman for dates, places and any other pertinent information. 310-558-4872 - sonnyw04@ca.rr.com

Michigan Small Scale Live Steamers (MSSLS) hosts a large number of steamups. For details on What, When and Where, go to their web site at http://www.mssls.info/

Upstate Steamers, upstate New York steamup calendar. If you are in the area, come out and join us!
http://gold.mylargescale.com/Scottychaos/upstatesteamers/

Puget Sound Garden Railway Society steamup schedule: We have 2 steamups per month, one at the Georgetown Powerplant in Seattle on the second Saturday of every month, and a steamup at a member's track on the fourth Saturday of the month. Here is a link to our steamup timetable.
http://psgrs.org/livesteamtimetable.html

Jun 22-26, 2010 - Electric City Trolley Museum (NRHS Convention), Scranton, PA. For info contact Mike Moore trainman722@verizon.net

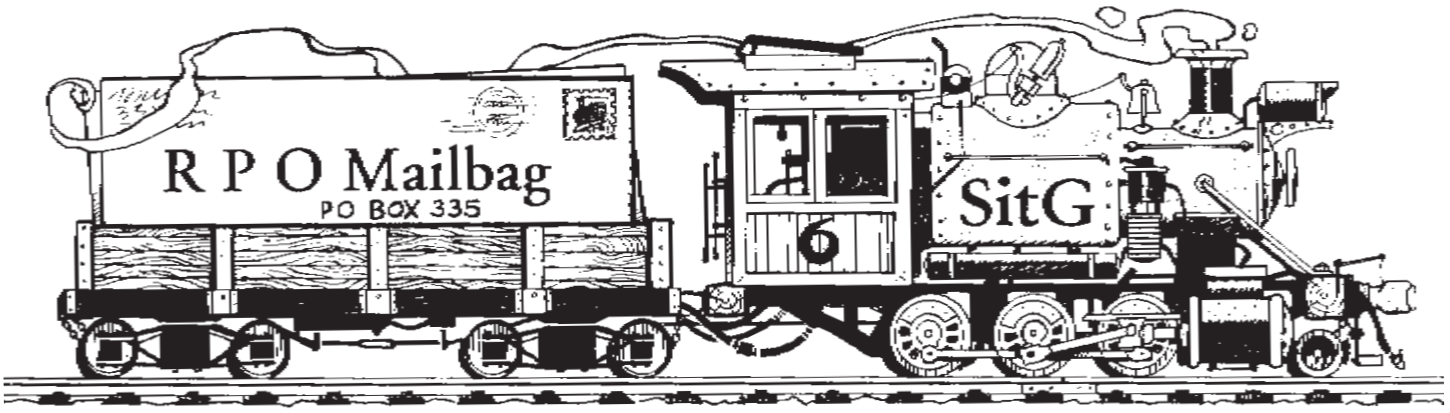
Jul 8-11, 2010 - Tuckahoe Steam and Gas Annual Show, Easton, MD. For more info,
http://www.tuckahoesteam.org/

July 14-18, 2010 the National Summer Steamup will be held at the Lions Gate Hotel in McClellan, Calif., a suburb of Sacramento. The 2010 event will feature both 45mm and 32mm tracks, a Saturday night BBQ dinner, clinics and workshops, exhibitor displays and swap tables. For more information please visit the web site at http://www.summersteamup.com/ or e-mail steamup@summersteamup.com or call (650) 557-2993.

Sep 3-5, 2010 - PLS Labor Day Meet, Rahns, PA. For more info, http://www.palivesteamers.org/

Sep 24 & 25, 2010 - Fall ECLSTS, York Expo Center, York, PA. For more info,
http://www.tbto.org/calendar/ca20100924.html

Check our web site < www.steamup.info > for up to the minute Calendar of Events.



via e-mail

Dear Ron,

I wanted to thank Mike Simpson for his article on building the Portable Layout ***(Simpson's Folly, Steam In the Garden #108).***

I have my 11 foot diameter track built, have started painting and plan on building the straight units soon.

Best wishes,
Art Gibson

* * *

via e-mail
Austria

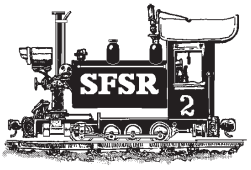
Hi Ron,

I recently bought an Accucraft Forney. OK, lots of others have too!!! , but I got a surprise. The Accucraft blurb on their website told me boiler capacity is 80 cc. I opened my package, unpacked the engine, a 2-4-4 unlettered version, (very well packed and no damage) filled the gas tank, then oiled her and started filling her up with water... 50 cc, another 50 cc... I thought now I'll have to take 20 cc out to make space for steam. Would you believe it, another 50 cc went in????? Thats 150 cc, so I started looking for the hole in the boiler..... No Hole!!!! So I took 25 cc out. That means that there is 125 cc left in the boiler. Now, after looking at my better half's WD Baldwin, it seems that this engine has the same boiler as the Accucraft UK WD Baldwin model has. So 150 ml/cc full, and 125 ml/cc working capacity. It is on the list with other Ruby locos but a quick look at the cylinders tells me they are not Ruby cylinders but the same as Accucraft UK BIG bore cylinders. The engine runs ***B e a u t I f u l l y***. runs slow, is controllable and I have run her with a train behind much larger than the prototype would be expected to pull for a little over 20 minutes. Then the gas was out. That's my best time with 4 log cars full of logs I only got 13.5 minutes. With open small gondolas 17 minutes. This engine is probably the best engine on the market for beginners at this price and it is a full model engine with valves and all that goes with it, not a fun and games wobbler toy. I've often wondered how I could repay some of the help I've received over the years from Accucraft. Particularly Cliff Luscher. I think I now know. A measuring glass!

Just a joke, I'm sure many more would buy this engine if they were told the details above. Yes, I have a grind, the rear truck mounting system could be improved by almost anyone. Even my better half!!! Ours now takes tighter radii.

Take care and I hope you are now, or soon will be, out of hospital.

Regards,
Bert Horner



Building a Steam Powered Model-T Rail Truck Part 1

By Howard Maculsay

A 1925 Tin-Lizzy should have been so lucky

In April 2008, I was inspired by Sonny Wizelman's "Matilda", a live steam rail truck which competed in the 2008 drawbar contest at Diamondhead... and won its division, I might add.

Since I had been modeling in Narrow gauge, I started looking for 1:20.3 scale plans for an early 1900's Model-T truck as the basis for my scratch build. In the August 2004 issue of ***Garden Railway*** magazine, a Ted Stinson plan set was included for a 1927 Model-T Oil Truck. This scaled drawing is available from Sidestreet Bannerworks. I also found that Northeast Model Products (nemodel.com) makes model kits in its"Tin-Lizzy" line that has some of the more difficult parts, such as the radiator, steering wheel and headlight castings for a 1925 Model-T Stake Side Truck. So I settled on this as my underlying design for my Model-T Rail truck. More research turned up another useful picture on finescale.com

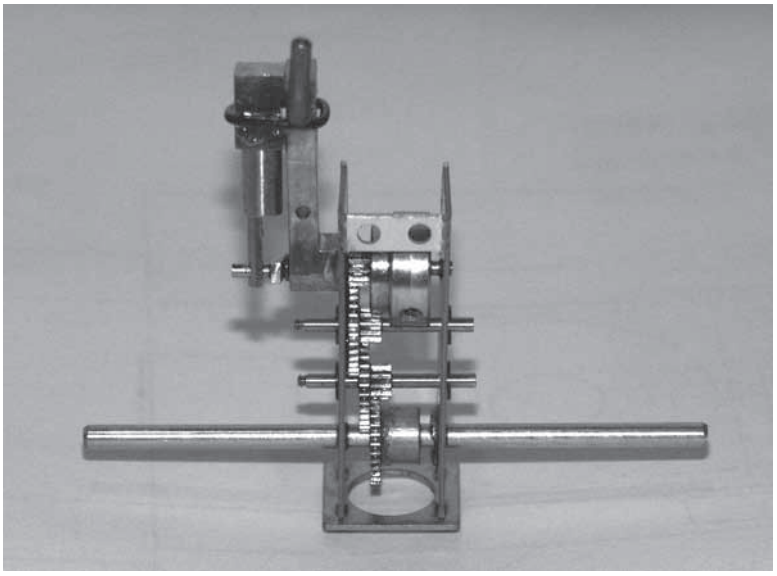
L.P. Stewart & Bros.

Although I was able to find documentation that Model-Ts were used as rail vehicles, what I wanted to do was certainly not prototypical.

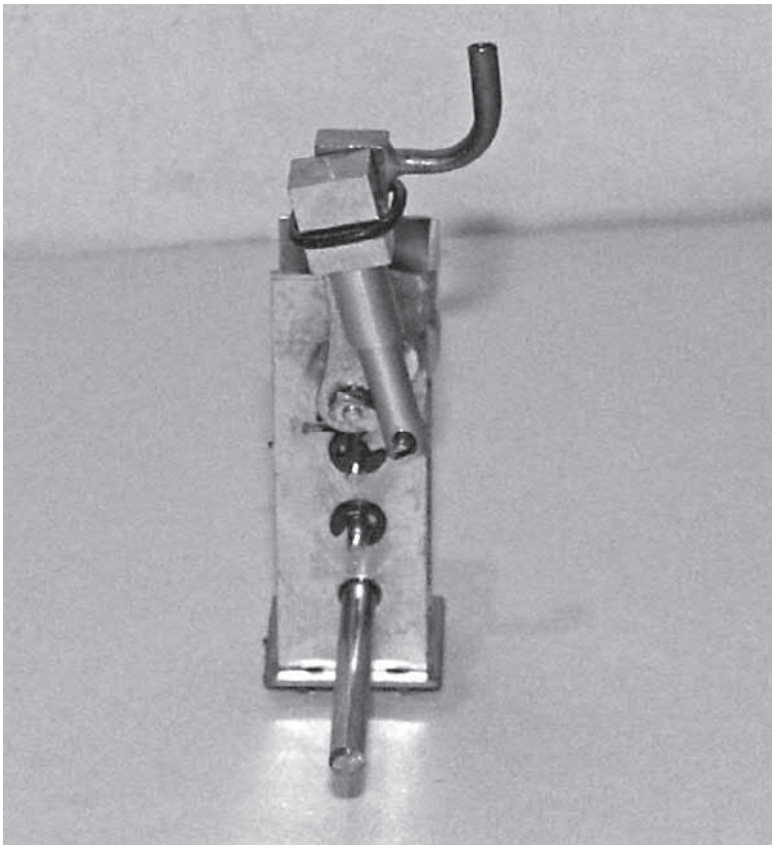
I wanted to power it with a butane-fired boiler and steam-motor, and still stay close to the 1:20.3 scale Model-T Stake Side Truck dimensions. The trick was going to be finding live steam components with the dimensions of the Model-T vehicle.

My initial searches didn't turn up any candidates until an April 2008 weekend steam up, where Sonny Wizelman graciously brought his rail truck, Matilda. It was obvious that staying within the confines of the 1:20.3 scale was going to be difficult, if not impossible. Major length extensions to the truck bed would be required to hold the steam components I had in mind. But, lo-and-behold, Sonny's next live steam project, a Steeple Cab switcher, required a small steam motor, boiler, and butane tank.

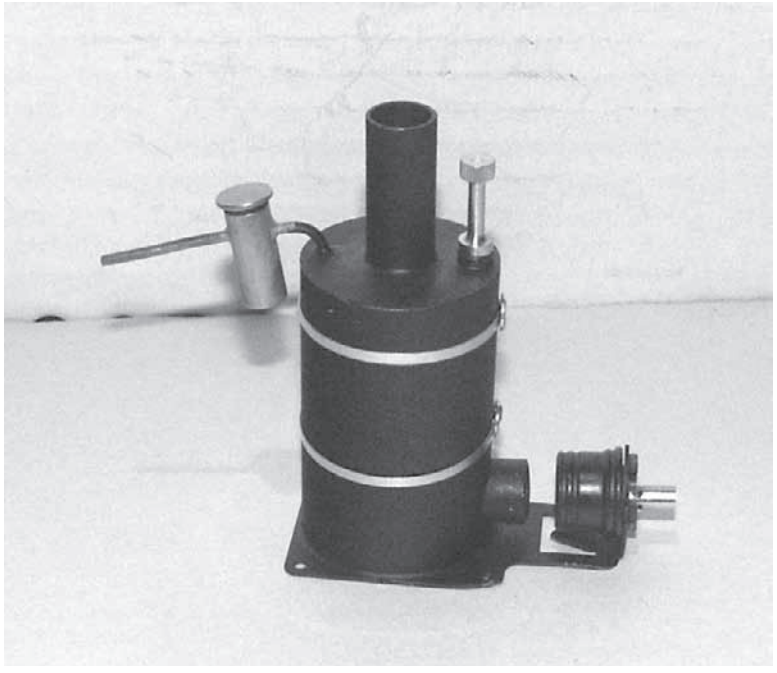
Sonny had acquired the steam components from a "Pepper" locomotive but had since decided on a different solution and was about to return this little German made steam motor, boiler and butane tank to Lutz Hielscher at www.hielscher-dampfmodelle.de. Size-wise, the steam components looked to be just what I was looking for, so we made a deal.



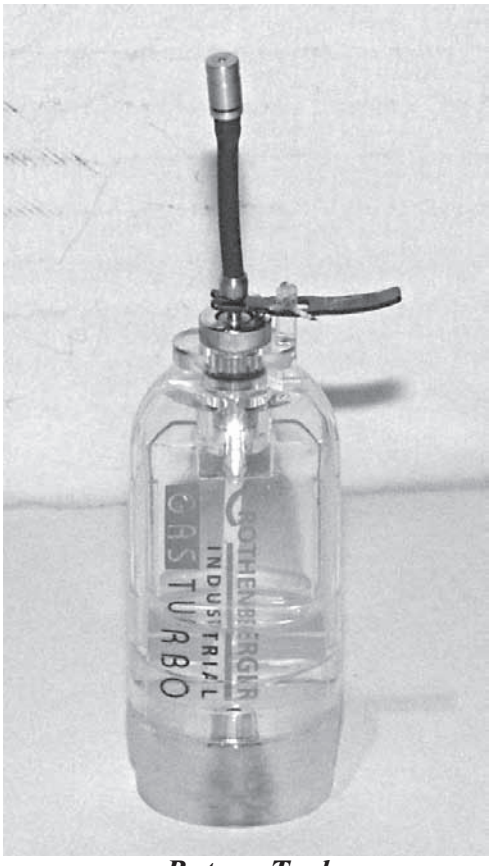
Cylinder & Gear Train



Cylinder & Gear Train



Boiler with Burner attached



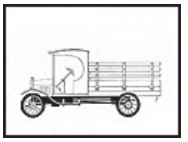
Butane Tank

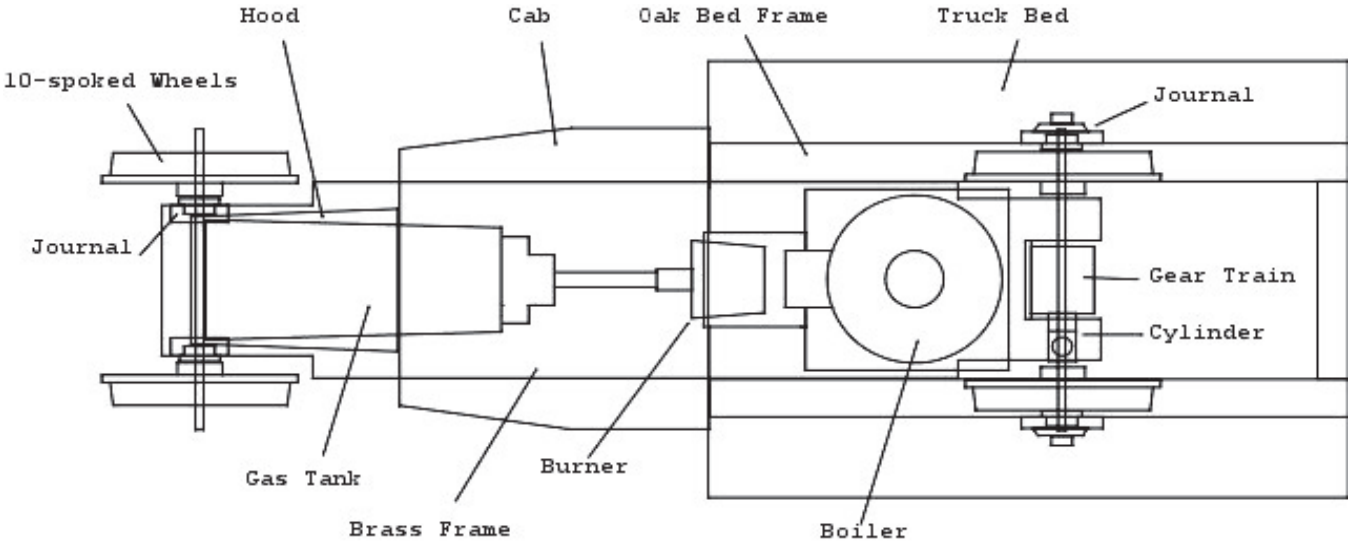
The Steam Components

Oscillating Cylinder Steam motor:
2" tall x 1" wide x 1/2" deep
40:1 integrated geared drive train
with 1/2" dia. Flywheel
Piston: 3mm (1/8") dia., stroke length 5mm
(13/64")
Integrated final drive: 2.5mm dia. used as axle
Boiler: 56mm (2 1/8") tall, 35mm (1 3/8") dia.
+ 1 1/16" tall chimney
Water capacity 30ml
Single L-shaped flue
Burner- external blow torch aimed at the
L-shaped flue
Steam outlet pipe .080" dia.
Feed-thru lubricator 5/16" dia.,13/16" tall
Butane tank- plastic 2 3/8" long x 1 1/8" x 7/8"
Ronson type filler valve
Built-in needle valve, with on/off lever
Integrated flexible feed hose with jet attached

The steam motor has to stand directly over the rear axle, since it is integrated with the steam motor's geared drive train. So, to get the shortest overall length for the steam components I placed the boiler just 1/8" ahead of the steam motor. This arrangement should produce the dimensions around which everything has to be placed on the General Arrangement Drawing.

Continued in next issue...





General Arrangement Drawing

Building the Saugus Highline Railroad Part 2

by Eric Strauss
photos by Rick Parker

Some of the drawings and photos referred to in Part 2 can be found in Part 1, SitG #110 - ed.

Framework to Support Connections

To connect the uprights to the framework, I used 8" long 1⁄2"-13 threaded stainless steel studs which simply slide into 17/32" holes in the frames and uprights. The entire railroad is basically sitting on these heavy pins. Per the drawing (see Figure 3 and photos 3A, 3B, and 3C), each stud has a nut which allows for a +/- 1" height adjustment if needed for settling over time (we also have earthquakes here). As you can see, the stud is bonded to the upper nut and large fender washer which support the frame. This washer is notched for a pin in the frame which prevents the stud from turning during adjustment.

The bonding material I prefer here is Armstrong A-12, an industrial/aerospace structural adhesive that I used professionally. If properly applied, this is strong, dependable stuff. It mixes to a muddy, easy-to-use consistency with a non-critical mixing ratio of about one to one. The critical key to bonding successfully with any of these materials is to be sure the surfaces are free of all dirt, grease and oxidation before bonding.

The height adjustment nut has a nylon insert which secures the nut in position once adjusted. Clearly, the holes in the frames and uprights must be carefully aligned/drilled to ensure a level framework when finished (I made a fixture for this). On the plus side, this approach gives angular stability at the riser-frame interface and offers a smooth, very precise and easy height adjustment. It also simplified the overall assembly of the railroad. It does require the assembly/bonding of the stud-washer-nut units, however, and it is not cheap. Each stud assembly cost approximately $7.50 back in early 2008 through my supplier, McMaster-Carr (web address: www.mcmaster.com). Interestingly, metal prices have come down substantially and these same assemblies would now cost about $5.50.

Footings

Unlike the pre-cast Dek-Block footings which many fellows seem to prefer, I used footings with cast-in straps which are bolted to the uprights for extra stability and nailed on a plastic spacer (called a Composite Post Base in the trade) between the uprights and footings to prevent decay due to the wicking of water into the bottoms of the uprights. The spacer can be seen at the bottom of the post in photograph 3C. At each footing position I compacted and leveled the ground and added a 1⁄2" layer of sand for stability at the suggestion of my contractor.

Railroad Platform

In selecting a platform material for the track, I chose 5/16" thick smooth-surface Hardipanel vertical siding. This is made by James Hardie Siding Products (web address www.jameshardie.com). I am told that this material is used on the sides of barns in Minnesota and when properly installed, will withstand bugs, heavy rain, freezing, and the intense solar heating here in the San Fernando Valley without warping or cracking. The panels are made of a cement fiber mix. At 2.3 pounds per square foot, they are available in 4' x 8' sheets which are quite heavy (over 70 pounds). At times it took two of us to maneuver these panels around for cutting, etc. When cutting this material, carbide tooling is required and the manufacturer advises the use of a dust mask and a well-ventilated, preferably outdoor area.

After securing the cut-out platform panels to the framework using countersunk flathead screws, I primed the panels and then rolled on two coats of Life Deck pigmented concrete masonry color seal, which is a 100% acrylic resin product. The color I used (-11 Sand) is a fortuitous match to the dust and dirt that

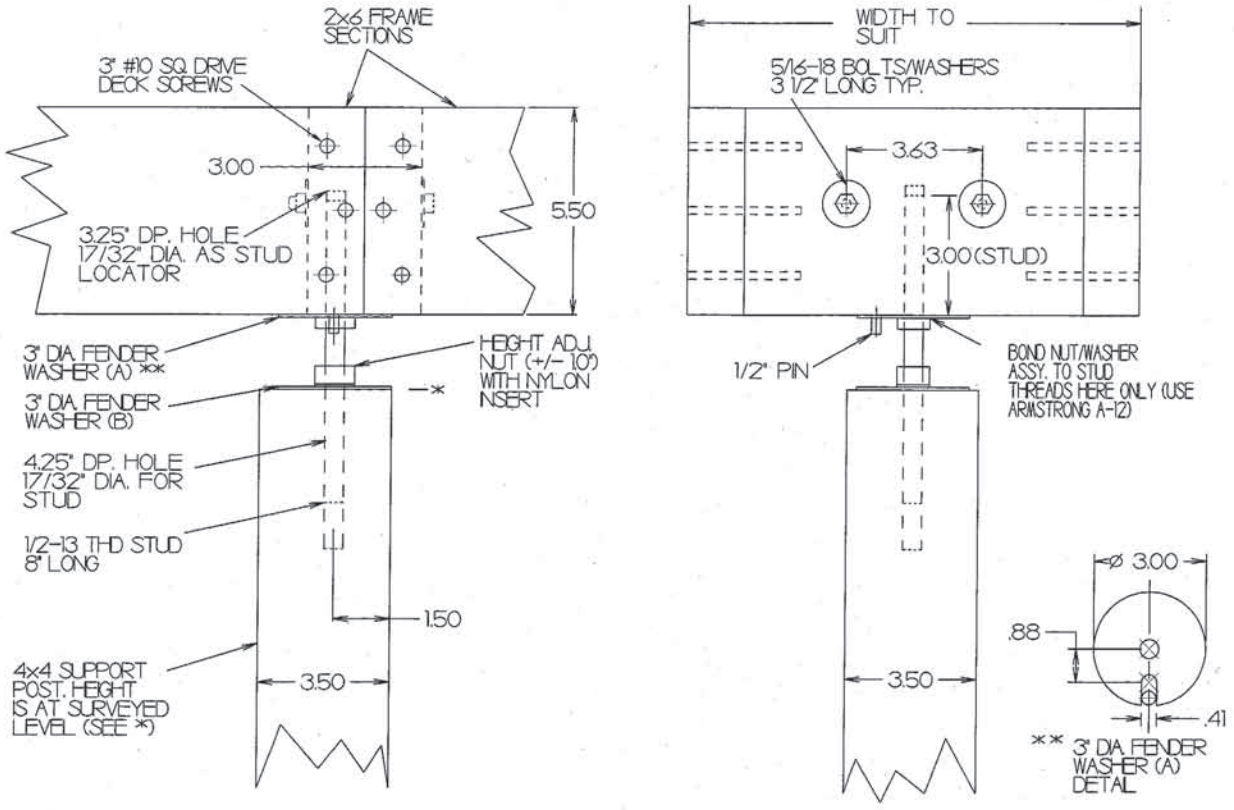


FIGURE 3 - RAILROAD FRAME SUPPORT

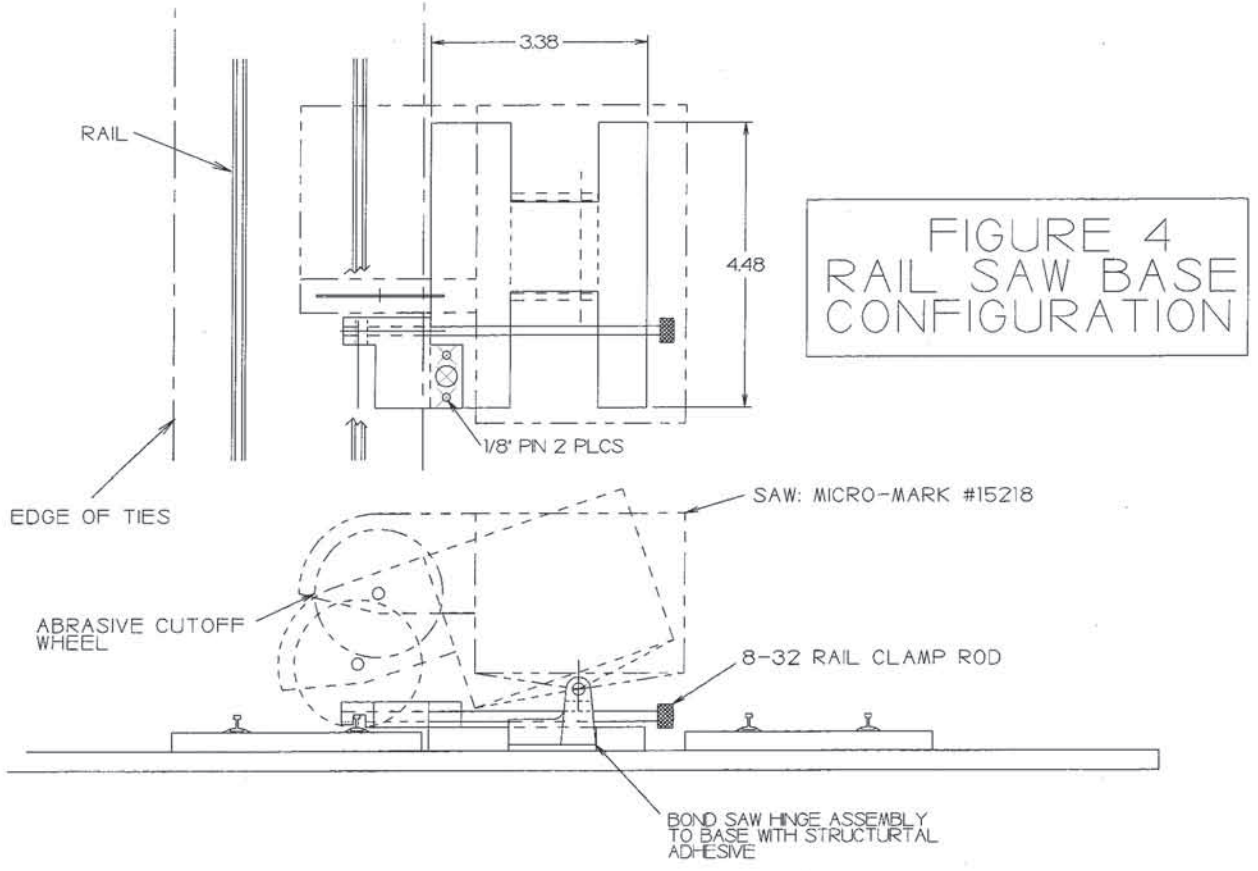
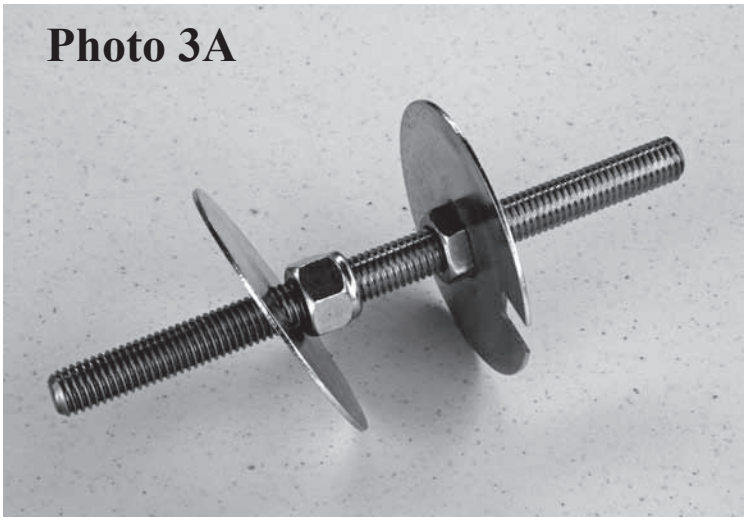
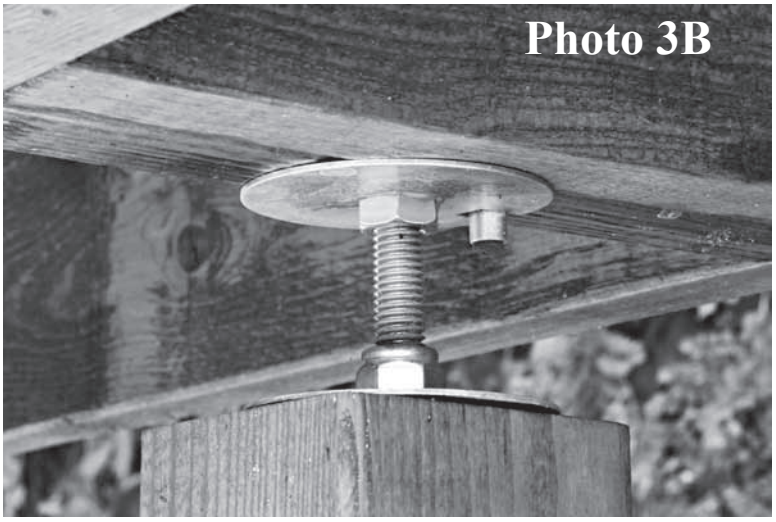


FIGURE 4
RAIL SAW BASE CONFIGURATION



Railroad support connector hardware.



Installed support connector.

Mounted benchwork on support post with strap/footer base.

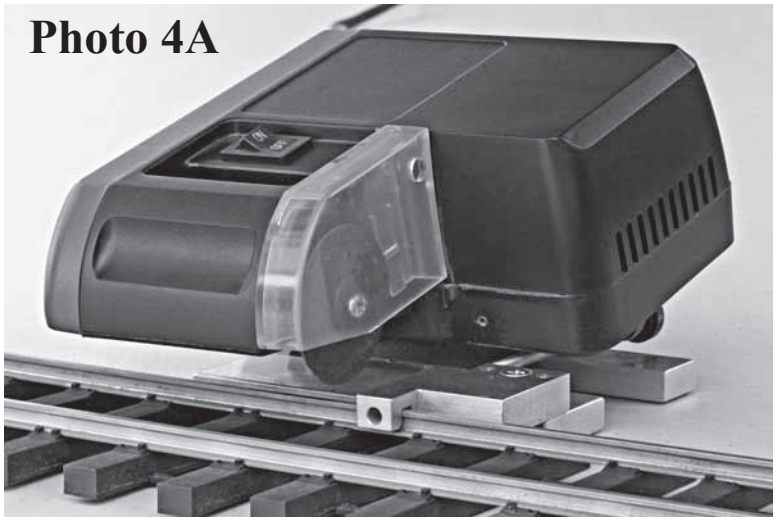
normally accumulate on a railroad. This material is tough!

To cover the edges of the railroad platform, I used a self-gripping vinyl edge trim with metal core from McMaster-Carr (their part number 24175K17). This stuff isn't cheap but as can be seen in the photographs, it sure dressed up the railroad and it protects and strengthens the platform edge. Attaching the edging merely involves tapping it onto the edge with a soft mallet.

Track

I used 6-foot lengths of Llagas Creek Code 250 nickel silver narrow gauge track and switches connected with Split Jaw rail clamps. To simplify my life I did not stagger the rail joints as many fellows recommend. My clamps are adjacent but carefully snuggled between the ties so as to minimize their visibility and avoid disturbing the tie spacing. I set the curves using the dual rail track bender from Train-Li (works great!) and bent the joined track sections in position on the platform to align with my pre-drawn guide lines. Per Train-Li's suggestion, when bending joined track, I first used double-length rail clamps at the joint, then bent the curve, then carefully removed the double clamps and replaced them with single clamps, resulting in lovely smooth curves (to my eye).

The curved sections of track are not connected to the platform but instead are allowed to grow/shrink to accommodate thermal excursions. The expansion effects appear to be uniform as there has been no noticeable effect on curvature. On the straight-track portions of the railroad however, the eye is acutely



Rail clamp base for abrasive saw.

aware of even small misalignments. Here, the track is pinned in position every 2 feet or so by match-drilling locating holes through the tie strip tabs and platform and simply inserting blackened stainless steel 3⁄4" x 4-40 screws which serve as pins. I devised the base replacement shown in Figure 4 and photo 4A for the tiny cut-off saw available from Micro-Mark (their #15218). After cutting the existing base off the unit, I bonded the new base to the saw's hinge assembly. This setup allowed me to clamp the saw directly to the rail in place on the railroad and, using an abrasive disc, made quick work of precisely cutting/fitting the track with perfectly vertical cuts.

Continued in our next issue -- Thermal Expansion

Workshop Project

Regauging Mamod Locomotives and Rolling Stock

by Steve Baker

Making axles without a lathe

There are two ways to regauge your Mamod equipment from 32 mm to 45 mm. First, you can buy the 45 mm axles for both rolling stock and locomotives and then install all the pieces. You will still find this article useful, though, to provide time saving tips on how to do it. Second, you can do the regauging in your workshop, using the existing axles and wheels. The techniques here do not require a lathe, just a drill press. Whenever in the work shop, using hand and power tools, remember to wear safety glasses and exercise safe workshop practices.

If you are going to buy your axles, you will also need to get a spacer kit for the locomotive. This consists of a pair of brass spacers, a pair of gaskets, longer screws and replacement nuts, for widening the cylinder location to stay aligned with the wider wheelbase. Part two in the next issue will cover regauging the locomotive.

This project is not particularly difficult, and should easily be completed in an afternoon.

Disassembling rolling stock

Mamod rolling stock is constructed the same way on all cars – with rivets. However, there is a trick to not having to remove / replace the rivets. Undo the buffers (1/4 inch wrench), and then the side rails can be carefully stretched apart to allow the axles to be removed. Note that the axles are the same length for both 32 and 45 mm gauge. Put the wagon aside, for later re-assembly. I use sandwich bags to store parts, and painters masking tape to hold it to the wagon. This keeps everything together, if you have an interruption in your project..

If you are working on a flat car, drilling out the rivets can simplify the disassembly. Then, use screws to re-assemble the chassis to the body. This allows you to add wooden planking or even make a two or four plank gondola. The screws are then hidden by the planking.

Pulling the rolling stock wheels off the axle

Make a wheel puller as illustrated in **Photo 1**. It is made from a piece of scrap 2x4 lumber. Having the ends square is not critical. Drill a 1⁄4 inch diameter hole about 1⁄2 inch from one side, and then use a chisel to open a channel which will hold the axle. Use a 1 inch spade drill to create the pocket. It needs to be long and deep enough to have the axle and wheel inside, with the axle not touching anything. Refer to **Photo 2** to get the general layout. No dimension is critical for making the wheel puller.

Using your bench vise, clamp the wheel puller and axle snug, but not too tight. Tap the vise with a hammer a couple of times, tighten the vise, and repeat until the wheel pops off. You will see the knurling which holds the wheel on the axle. Repeat to remove all wheels on all axles. Since the Mamod axle is aluminum, it is not too hard to peen the end of the axle. Honestly, I'm not sure I'll use these axles anywhere else, but you never know.

Making the new axle

Measuring the Mamod axle, the key diameter is where the axle fits in the journal box. The wheel hole is also measured. These dimensions are .118 inch and .160 respectively. They may have been manufactured to metric dimensions, but we're in America, and our hobby stores don't carry metric size stock, usually. .118 is .007 inch less than 1/8 inch, and the shank end of an 1/8th inch drill fits and spins in the journal box hole. .160 is only .004 larger than 5/32 inch. Here's the nifty part - if you go to your hobby store, and get a length of 1/8 solid brass rod, and a length of both 5/32 and 3/16 diameter tube, they make a telescoping tube assembly !

The 1/8 inch rod is cut the same length as the Mamod axle. The 5/32 tube is cut shorter, to not interfere with the journals, and the 3/16 tube is cut to set the proper back to back spacing (gauge) of the wheels. Slide the wheels on the 5/32 tube, put the assembly on a piece of track, and measure the back to back size. This is the size the 3/16 tube is cut to.

Slot the ends of the 5/32 tube with a razor saw. Depth is not critical, but make it long enough to be covered by the 3/16 tube at both ends. Use a triangular file to cut four notches in the wheel hole, spaced approximately 90 degrees apart. These provide clearance for the adhesive to lock the whole assembly together.

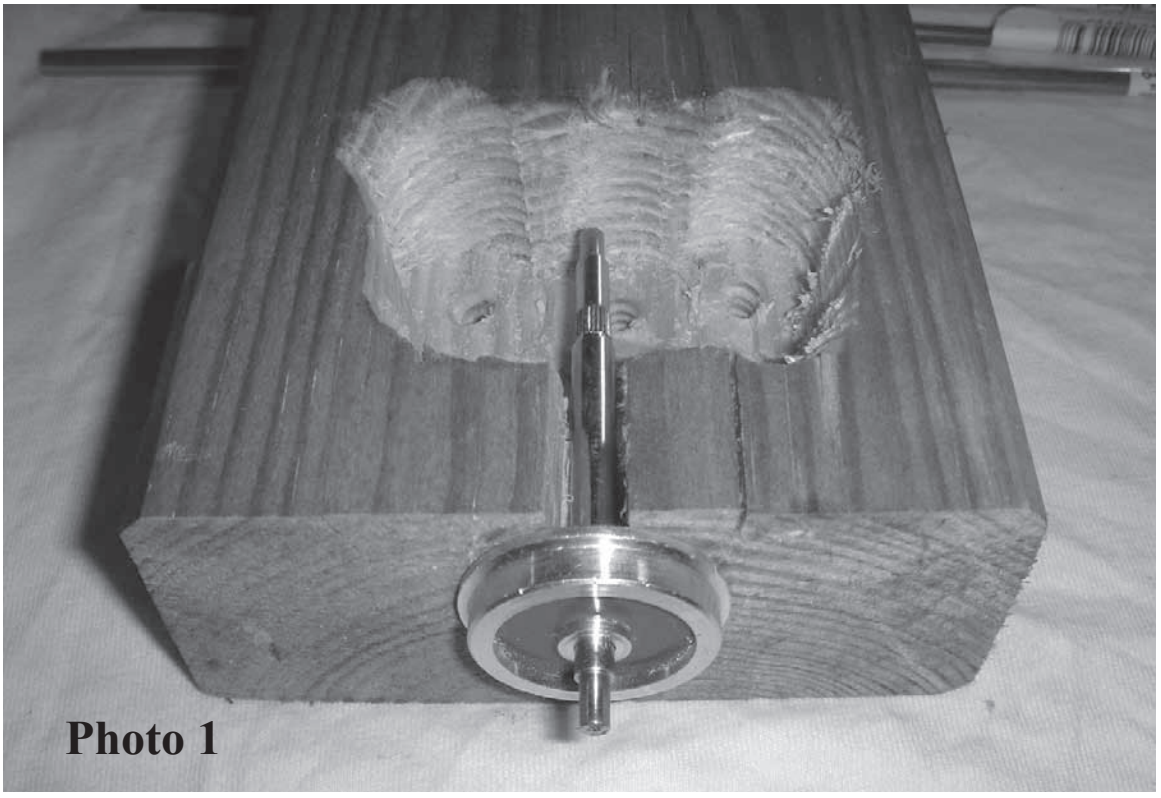


Photo 1

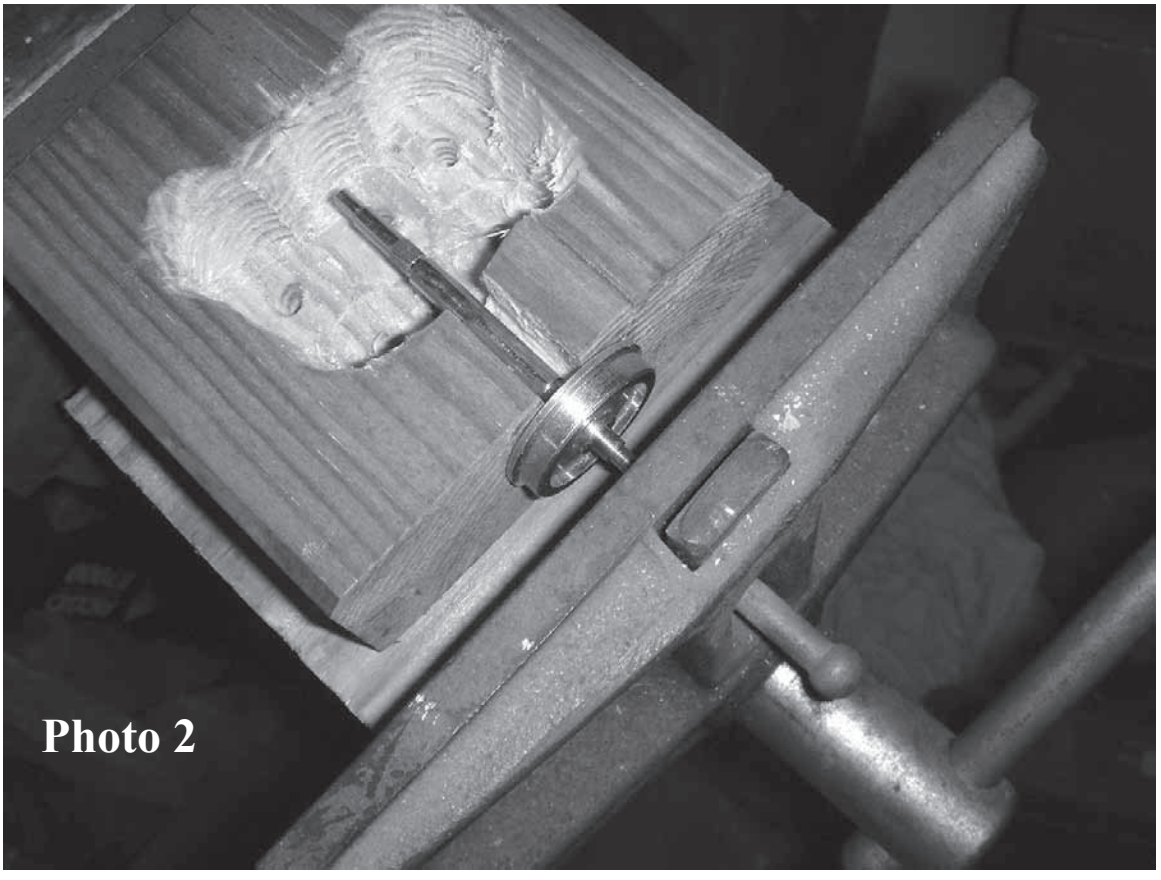
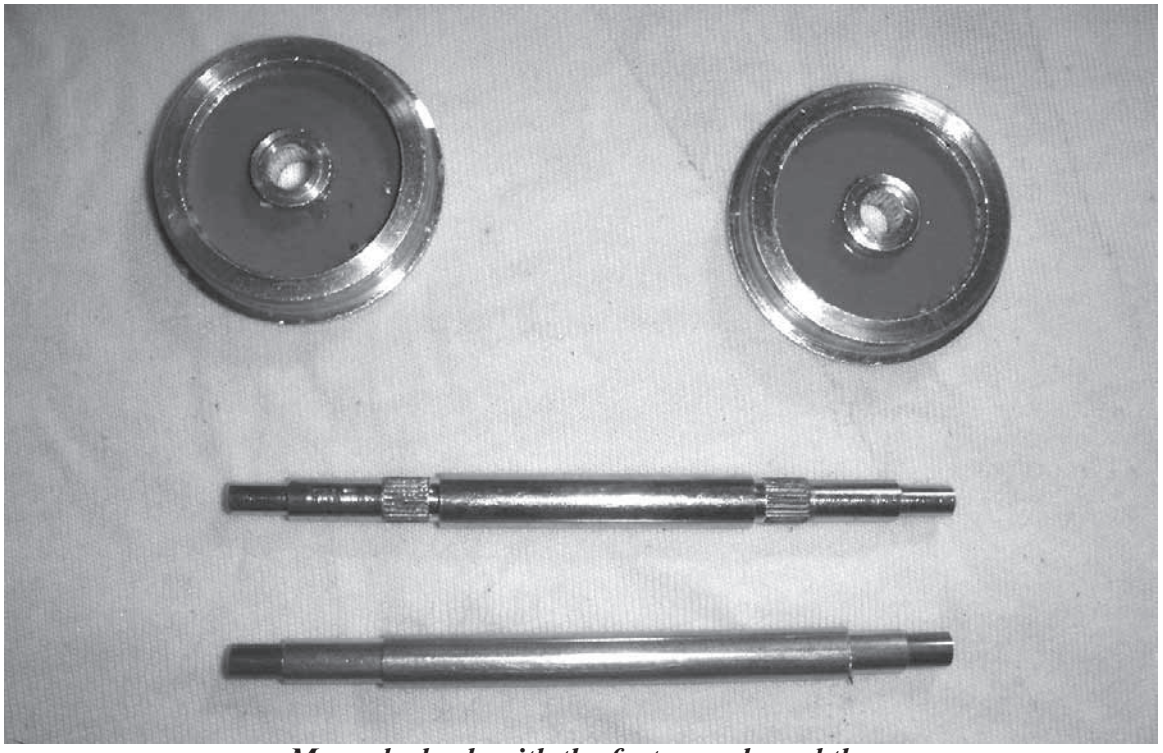


Photo 2



Mamod wheels with the factory axle and the new, regauged axle described in this article.

Assembling the axle and wheels

Fit the three pieces of tubing together, keeping the two larger pieces equally spaced from the ends of the 1/8 inch rod. Mix some two part epoxy, and using a toothpick, carefully apply enough to the areas where the wheels fit. Slide the wheels on, and gently rotate them two or three times to spread the epoxy. Last, again with a toothpick, apply a small amount to each side of both wheels. This will further lock them in place.

Let the epoxy set over night, and install your new axles.

Part two of this series will cover re-gauging your Mamod locomotive. The project is more involved, but again does not use a lathe nor mill. You will want a drill press to ensure drilling holes square, but that is not mandatory. Drawings for the brass spacer plate and gasket will be provided.

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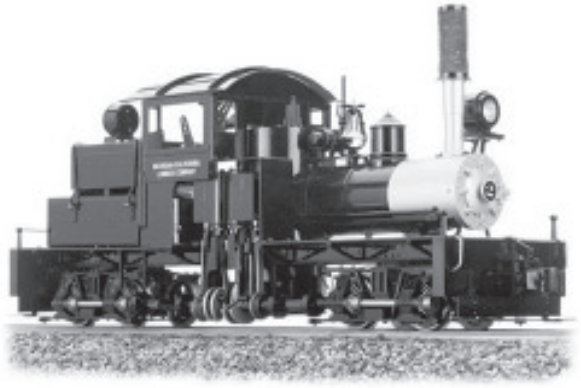

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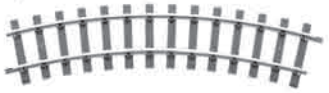

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Workshop Project

Mason Bogie - Part 4
Finishing

by W. Winn Erdman

Now that the pieces are done it is time to put it all together and make it look like something. First I wanted to get the R/C working. A servo was installed in the dummy firebox to operate the Johnson bar.

See Photo 1 - Reversing servo

The pivot for the Johnson bar goes through the firebox wall and has a lever which is moved by the servo via a push rod. The lower end of the Johnson bar is the little black object at the very bottom of the photo.

See Photo 2 - Throttle servo

The servo is under the air tank and will be covered by the coal load. The throttle is driven by the long rod through a flexible coupling on the servo. The battery and R/C receiver are inside the tender.

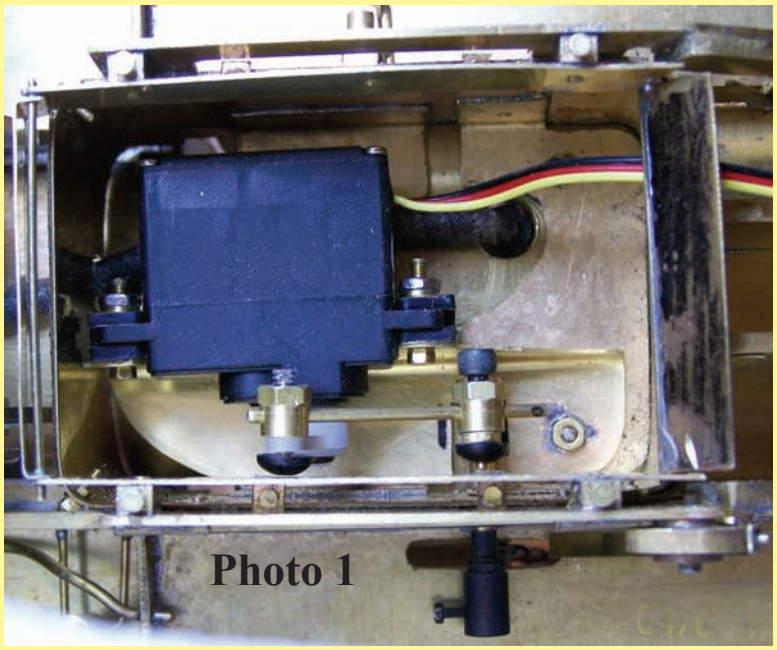
See Photo 3 - Tender with coal load

The power switch for the R/C receiver is the small shiny thing in the water fill port. The gas valve is at the front edge of the coal load. I glued wood veneer to the brass floor and running boards, leaving the polished brass edge showing. I used Krylon, Model Master and Dupli-Color (auto) spray can paints for all the finishing. The gorgeous decals were designed by David Fletcher and printed by Stan Cedarleaf.

See Photos 4 & 5 - Completed Model

I have run under steam power several times including twice during my invitational steam-up on October 10, 2009. By the end of the third run it was beginning to run quite smoothly but still needed water every 4 minutes or so and the fire had to be quite high to keep up enough steam. I was afraid to fire her before entering the model contest at the National Garden Railroad Convention for fear of messing up the paint. That proved to be an unfounded fear as firing caused no damage even during a short smoke box fire. I think with more running and maybe a little more tweaking it will be a nice running engine.

There you have it, a very satisfying project. There are some flaws but for my first try at anything like this I am pleased with the finished product. My skills are far from professional so I hope that this will encourage others to try something new. You just have to be willing to accept some failures and keep trying. My scrap pile attests to that!



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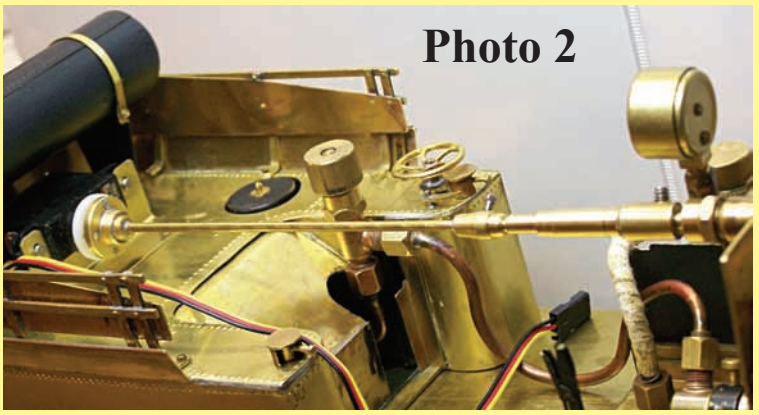
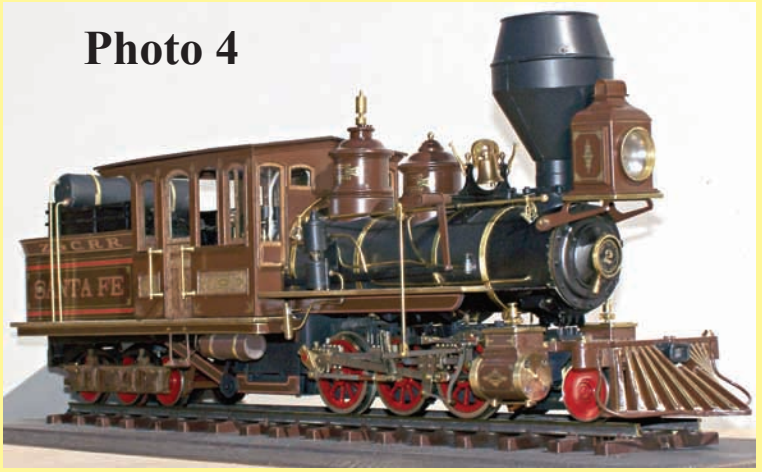


Photo 2

Photo 3



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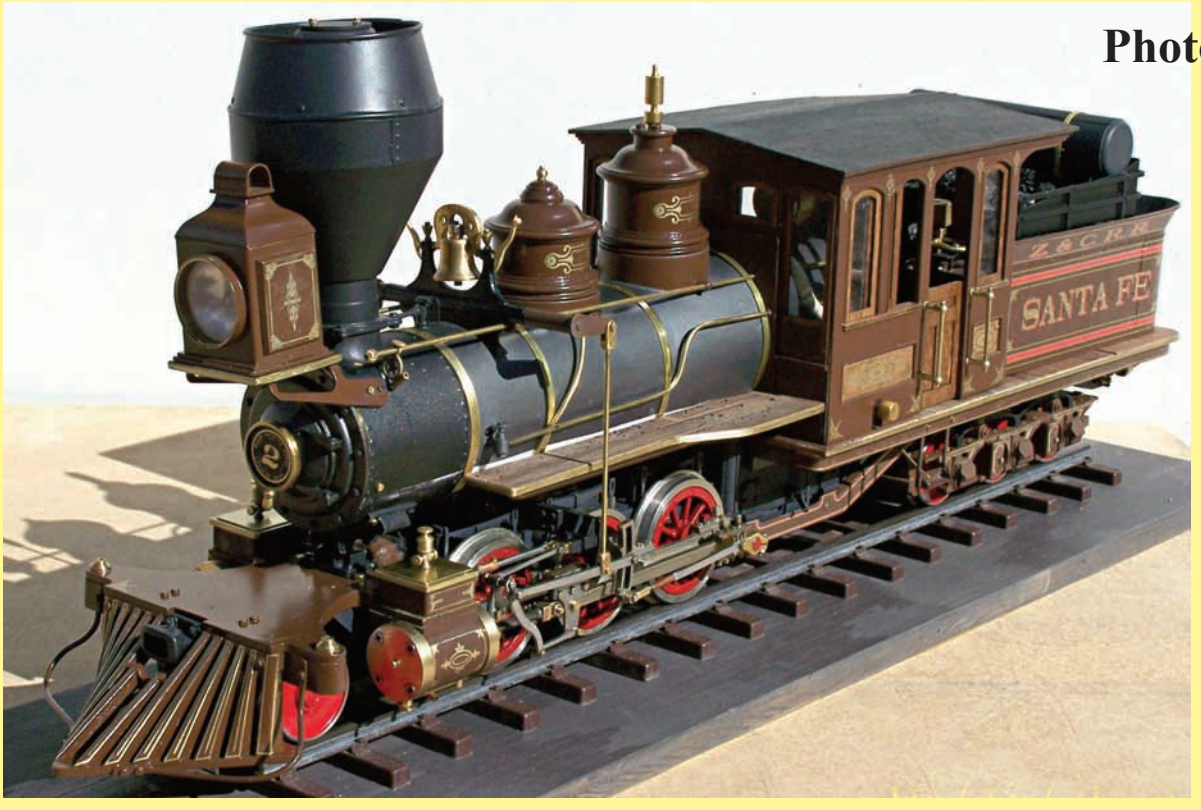

Photo 5

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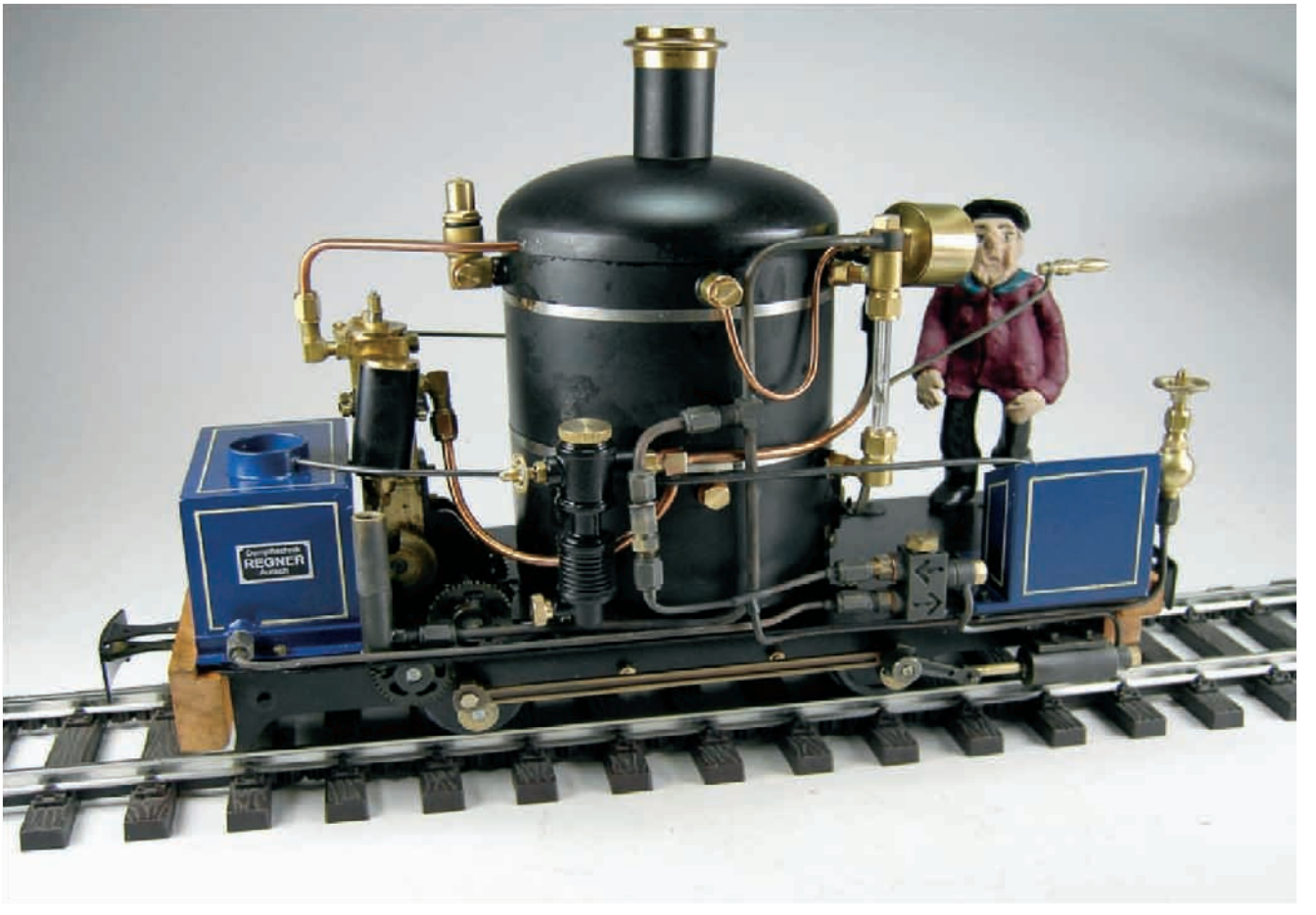

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TECHNICAL SPECIFICATIONS

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Workshop Project

Standard Gauge to Narrow Gauge Converting an Aristocraft Mikado to a 1:20.3 Hauler

by Mike McCormack

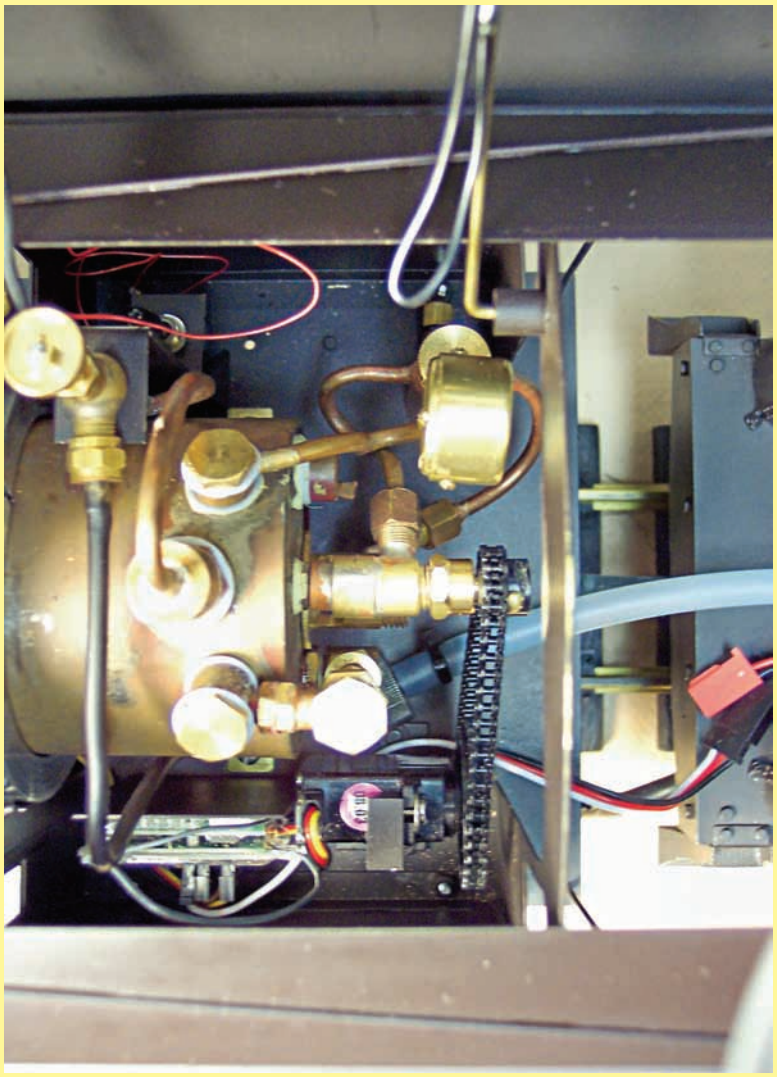
My first thoughts upon seeing the AristoCraft live steam Mikado prototype at Diamondhead a few years ago were; "Its plastic-that's different", and "I could convert that into an East Broad Top RR mike". After a conversation with Kevin Strong, EBT fanatic, I learned that the driver diameter is too small to represent an EBT mike, so if I did convert it I would have to make it a "catalog" Baldwin narrow gauge Mikado. With those thoughts in mind, that's what I decided to do. This article is intended to be a "10,000 foot" overview of the conversion process as opposed to a step-by-step narrative. The time span of this rebuild was about one year of on and off effort.

The author's completed conversion from standard gauge to narrow gauge.

As some of you know, I am fascinated by all things Cuban narrow gauge. As it turns out there was an iron ore mining operation in the Juragua area of Cuba. This mine was controlled by the Pennsylvania Railroad. Ore from the mine was shipped to the Sparrows Point (Baltimore) steel mill, which manufactured rails. Although the prototype railroad only purchased 2-8-0s, what better a line to have purchased a "catalog" Baldwin 2-8-2 to haul heavy trains of 2 bay hoppers loaded with iron ore (think Bachmann 2 bay steel hoppers)? With this scenario fully thought out it was time to find an Aristo mike.

A period of eBay watching yielded a reasonably priced example of the mike. After a couple of test runs to verify that I had a keeper, except that the gas tank and regulator left something to be desired, it was time to make a kit out of the mike.

I started by stripping down the tender. As it turned out the only parts I ended up using were the trucks! I was going to have to scratchbuild an appropriate narrow gauge tender. The locomotive yielded a number of useful items that included the running chassis, the lead and trailing trucks, and the boiler (less smokebox)



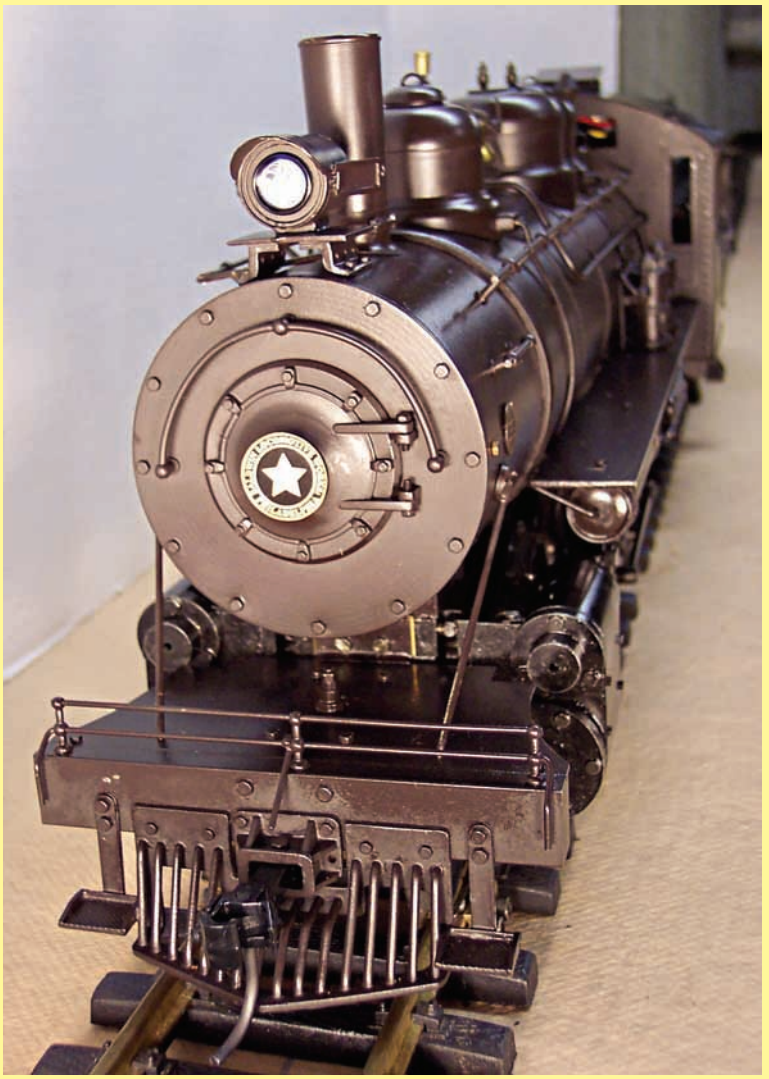
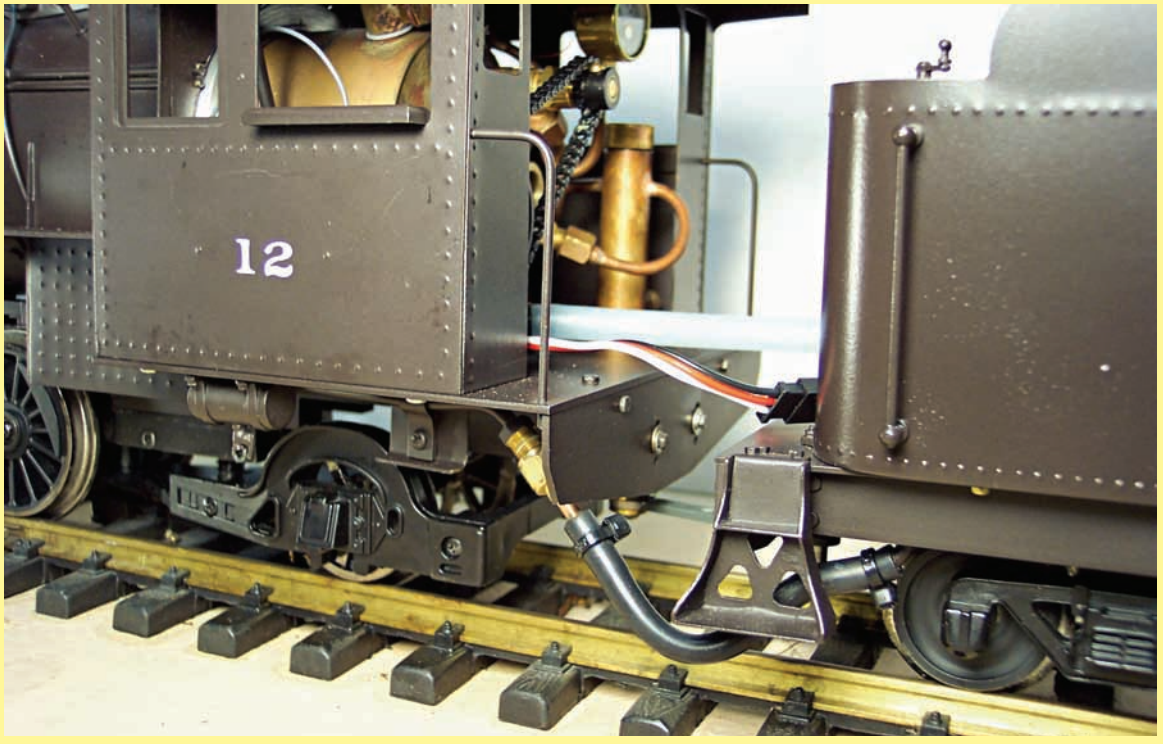
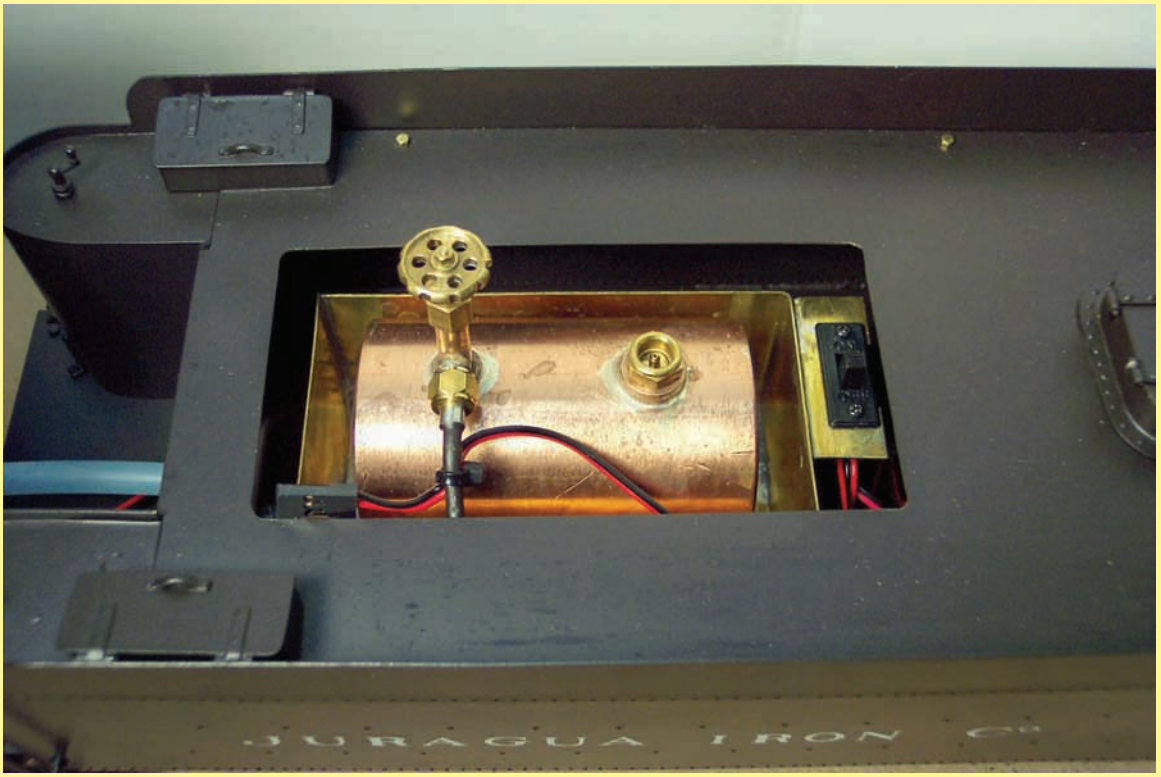


Photo above left: Cab interior controls and mechanics. *Photo above right: Front end treatment.*

Photo below: Connections between locomotive and tender.



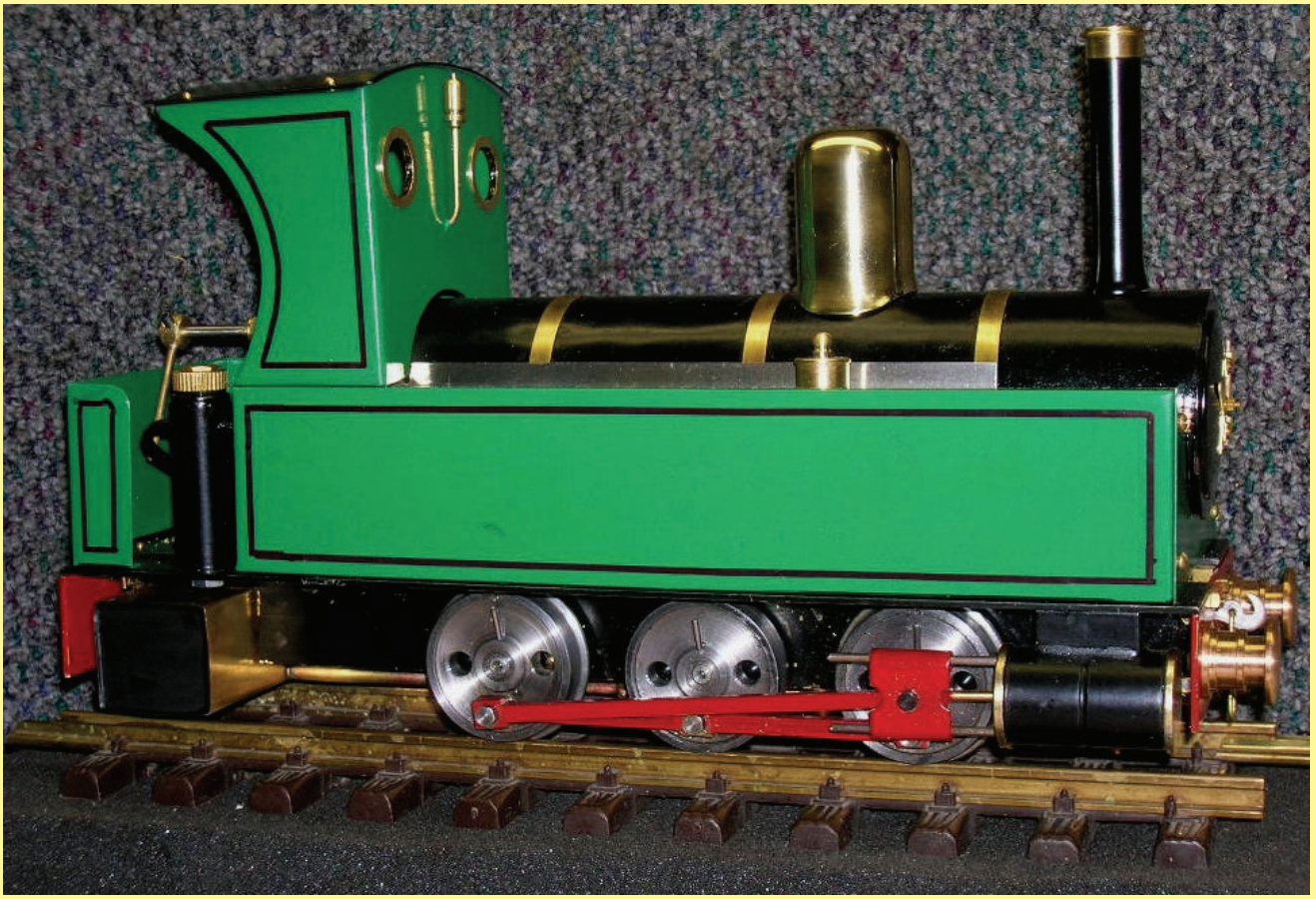
The author's scratchbuilt tender, nicely detailed.



Mounting the fuel tank in a tender water bath keeps the fuel pressure constant no matter what the ambient temperature might be.

continued on page 40...

STEAM SCENE



MAJOR MRPHY, scratchbuilt by Larry Herget entirely from the scrap box in just 3 weeks. It's an identical clone of an Archangel Sargeant Murphy except for the track gauge, and is called Major Murphy as it uses Gauge one track, not Gauge "O" as a Sargeant Murphy does.

The bottom photo shows the coaches Larry built for Major Murphy to pull.

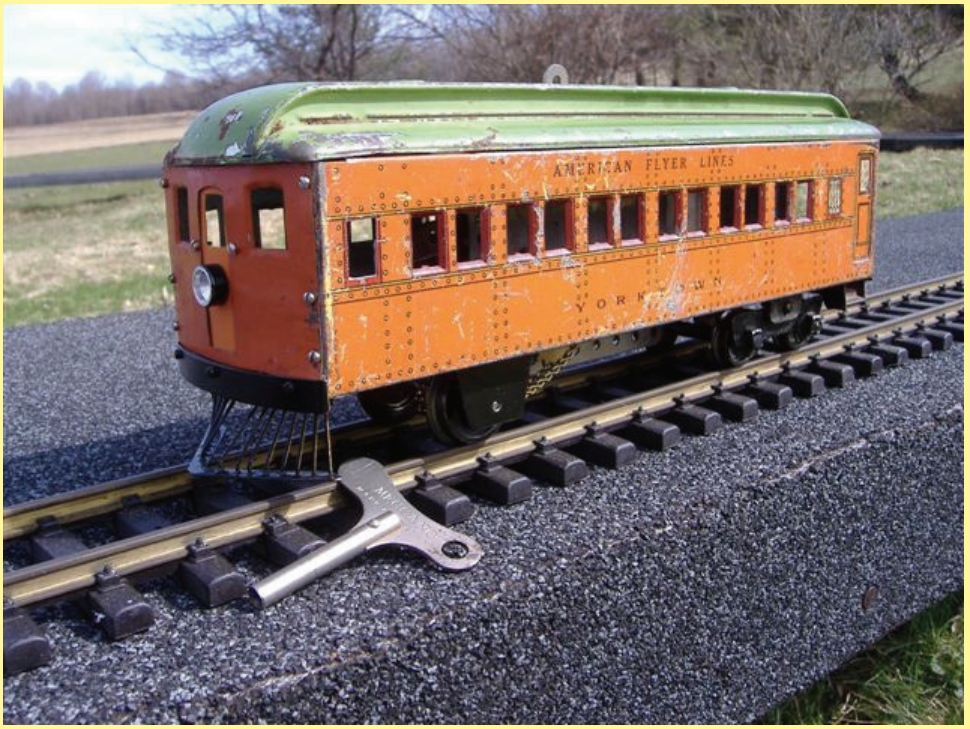
photos by Larry Herget

Clockwork and Orange

by Carl Berg

Rob Kuhlman made it possible for me to get an old Meccano clockwork mechanism. This mechanism is quite large, about the size of a peanut butter and banana sandwich (Thank you, Thank you very much.). Because of it's size, it's a little hard to hide. But, I think if you did a survey of the available, sturdy, clockwork mechanisms you could experiment with, you might conclude the vintage Meccano unit is the best one. It's quite robust, should last a long time and is probably repairable.

Jeff Young built a very smart "O" gauge tram with one and reported it would pull a car with a 9lb. anvil on it. My first thought when I read this was that you could overdrive the mechanism for speed or distance. I initially thought I'd test this idea out by mounting it on a board and putting some wheels under it, but that just wouldn't do. So I pawed through my pile of stuff and came up with a much abused body of a standard gauge American Flyer tinplate car, a roof that almost fit it, an old standard gauge truck and some other things.



I really enjoy old tinplate. The chipped paint, bits of rust and dents trigger something in my mind. Probably something of clinical interest.

I have actually made up a couple of standard gauge consists to run on G1 track. One is a passenger train, the other a work train. I usually take them to local gas and steam shows along with some steam engines to make a dynamic display. They usually get a good reaction.

Standard gauge tinplate is on the ragged edge of collecting for me. I look for distressed units and pieces. I don't like over paints unless they're old. As with everything I seem to like, they're getting harder to find. For this project I started with "Yorktown" an American Flyer observation car. At the time I found it I hadn't known that American Flyer even made standard gauge. As rare a sight as this thing was for me, it was so beat up that I didn't think the collectors would miss it. There was no roof and the floor was too bent to be usable.

I drilled out all the rivets and it came apart. I made up a floor blank out of 3/32" aluminum and set out the other parts to visualize how it would go together. The Meccano clockwork unit has a winding shaft, a stop lever and a reversing lever. All shafts (arbors) run in the side plates, steel on steel except the drive side of the output shaft. It has a brass bushing. The output shaft is .158" in diameter, a little over 5/32". Once I was assured the mechanism ran freely I mounted a ladder chain sprocket on the output shaft and set the mechanism deep into the floor plate. I modified a standard gauge truck to accept a pair of Bachman small wheel sets and made tapered vertical supports through

which the drive axle was mounted.

I turned the body back to front and made a new cab front where the entrance to the observation deck had been. I had a Lionel roof from a medium (300 series) sized car and this fit the body with a little modification. Details include a headlight and a pilot made from flats and brass wire. I had to put a hole in the body to access the winding shaft and fortunately did a pretty good job of centering it. In service it goes 110 feet or so on my 5' radius track. This is in contrast to the 140' + it has gone on the more majestic radii of Jim Stapleton's track. I have to say that the unit looked very good passing by on Jim's metals.

I think this brings us to the question: where or under what circumstances does this or any other clockwork loco look best or engage our interest best? This is kind of subjective, but bear with me. Clock mechanisms only have so much power. You can, within limits, manipulate how the power is expressed, though I suspect that each manipulation is a drag on output. Consider Orange, I originally thought I could overdrive the Meccano unit but that left some power in the spring. At the end of the run I'd lift it off the track and the axle would make several revolutions. Eventually the best ratio I found was 1:1 which put all the power on the track. As it sits, Orange is probably as good as it can be, provided it is kept adjusted and serviced. On larger radius tracks it will accelerate to a scale 60-70 mph, run some distance and slow to a stop on a time ratio of, say, 1:4:1. When I take it to a meet it'll have an audience for back to back runs. People will walk away when you run it a third time. So, the smart thing to do is run it twice, take the roof off to show the mechanism and the construction and then put it away. This is what I call it's "program". The most famous "programmed" layout for clockwork was in England. It was called "Crewchester", and there have been a number of articles written about it. (For ex-

ample: "Crewchester Model Railway" in *Model And Miniature Railways* (1976) pp 356-9.)

Is there anything else I can do with It? Well, yes... but you have to change things around. For example, another car body came my way and an interurban with a trailer is more interesting than an interurban by itself. The thing is, the trailer car has to have practically no drag so it won't affect the duration of the run. I'm working on that.

Another interesting development is the "Teleguv" clockwork unit. These units are quite famous. Jeff Young has one and I'm hoping to see it some time. To give you an idea how it works: do you remember dial telephones? Do you remember how smooth the dial returned each time you spun it? Do you remember having the same dial phone in your house for decades? A spring and a governor controlled the dial return. In England, the governor was adapted to control a clockwork train mechanism. As luck would have it I was telling this story to Jim Barker who happened to have some old telephone dials and was kind enough to let me have a few. Between one thing and another I may have accumulated an additional Meccano unit or three and adapted the dial governor to one of them, mounted it on a chassis and made some observations. The governor slows the speed of the mechanism considerably. Where Orange completes it's run in 30 seconds the governor controlled chassis stretches out it's run to 2 minutes for almost the same distance. I have it set up to engage and disengage so the unit has 2 speeds. For now the potential benefit of this adaptation would mean I could successfully run "Orange" on smaller radius track, and still have the ability to run fast.

Another facet of clockwork is that, in today's parlance, clockwork is "green", a point I may have made to some acquaintances as they were filling their locos with large containers of butane and alcohol. I suggested that, as a consequence, clockwork locos should have more track time and perhaps a subsidy or two in order to build up "green" credits to offset the operations of their units. Their reply, which I have to say came quite close to the border of politeness and civility, was to the effect that my 3⁄4" scale armored rail gun, which celebrates man's long tradition of fascination with noise and concussion leaves a carbon footprint 10 feet long and several feet wide every time I set it off.

I haven't mentioned the idea to them since.

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The Nuts and Bolts of Shays
Trucks for S/N 2091 "Dulong" Part 2

By Dan Rowe

In the last issue I stated that I did not know which drawing of the truck plan was used for the Dulong. A note on the wood bolster card 9521 solved the problem. I would have never guessed that card 16006 was the proper drawing as it is titled SPEC. TRUCK and it was drawn for shop number 1681. This Shay had 47" outside gauge wheels with an 8" face for wood rail. I did not have enough time after the discovery to get the detail cards for the bottom bars, card 9713 and the arch bars 9720, but they show well enough on the assembly drawing so I went with that.

There are two major pieces of this truck I have not found drawings for. The first of these is the end casting for the upper bolster. I know the pattern number is 01683 but none of the existing records indicate which drawing card. The casting can be seen in the Repair Parts page that was in last issue; it is part 3215. It must be a simple 1⁄2" thick plate with a 1⁄2" rectangular bezel to fit on the bolster ends. The photo shows the locations of the flat head wood screws that hold it in place.

The other piece that I cannot find is the center plate. It is casting H-6 1⁄2. I used the dimensions found on the truck cards and then modified center plate casting H-6 found on card 242 to fit. My drawing of what this part might have been is included in the drawings.

Most of the small 10 ton Shays had solid drivers. Both of the Mapleton Shays had wheel centers with shrunk-on tires. I think that this must have been an extra cost item as so very few had tires. Most of the ones that had tires were export locomotives which would make sense operating so far from spare parts. I do not have the tire profile for the Dulong but it is my belief that it is a standard tread design because this tire was also used domestically. The tire profile for the Mapleton was not the standard design and it will be the next issue with the Mapleton truck drawings.

The truck drawing card 16006 was redrawn using the narrow gauge parts. The drawing is the standard Lima Locomotive Works layout with a split side view showing both the left and right side.

If we make the assumption that side view is the right side only, then brake rigging in the drawing is shown for the rear truck. The long vertical brake rod that extends above the arch bars connects to the frame brake rigging. This truck brake rod is pulled by the frame brake rod so it has to face the center of the locomotive. The diagonal bracing is on the other end of the truck so it will not interfere with braking operations. The photo of this truck in the Repair Parts shows the front truck because the brake rigging is mirrored from the drawing.

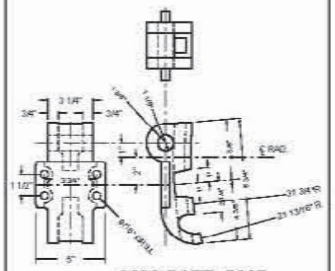
It was not possible to add all the detail of the brake head. It is a very busy part with a lot of dimensions. The main dimensions are shown and the key feature is a rectangular hole that runs vertically. The center section of the back of the brake shoe has a matching rectangular hole. A thin wedge strip of metal is forced in the hole and bent over at the bottom to secure the shoe to the brake head.

The drawing of the socket washers was just a lucky find. A lot of the drawings have four cards on a full sheet. I ordered another drawing on the same sheet and sometimes the other drawings are just as interesting.

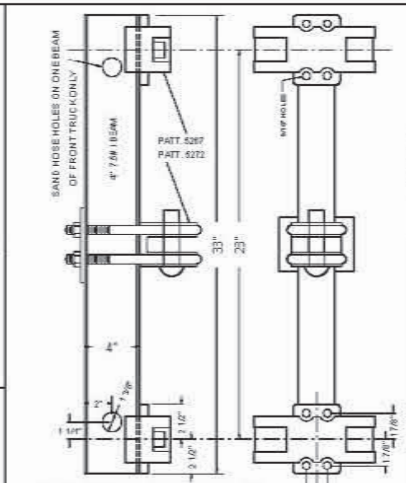
The truck for the early 2-6 x 10 engines was originally for the 2-7 x 7 engines that were made obsolete by the new engine size. The patterns were changed after the first few 2-6 x 10 engines to what is shown in the drawings except the brakes were rigged on the outside of the wheels. The note on the column indicates that the inside brake lugs were added in 1905.

The low drawing card numbers and pattern numbers indicate how early the truck boxes were in the Lima system. I have checked this truck until the end of production and the left side bearing box was always rigid. I believe that this was the only truck design that did not get springs or an equalizing lever for 3 point suspension.

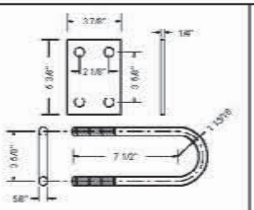
The next article will conclude the truck section with the drawings for the Mapleton truck.

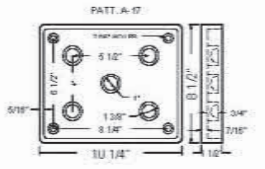


9802 PATT. 5267



9805 BRAKE BEAM 2-6x10



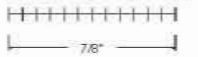


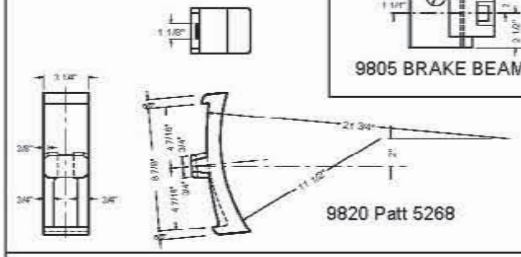
CARD 242 SPRING PLATE

16006 SPEC. TRUCK

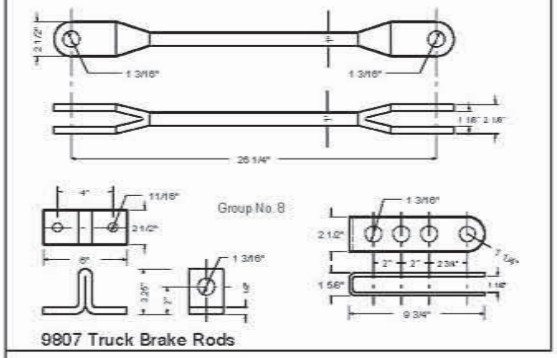
REDRAWN WITH 2' NARROW GAUGE PARTS FOR S/N 2091

SCALE 7/8"=1'

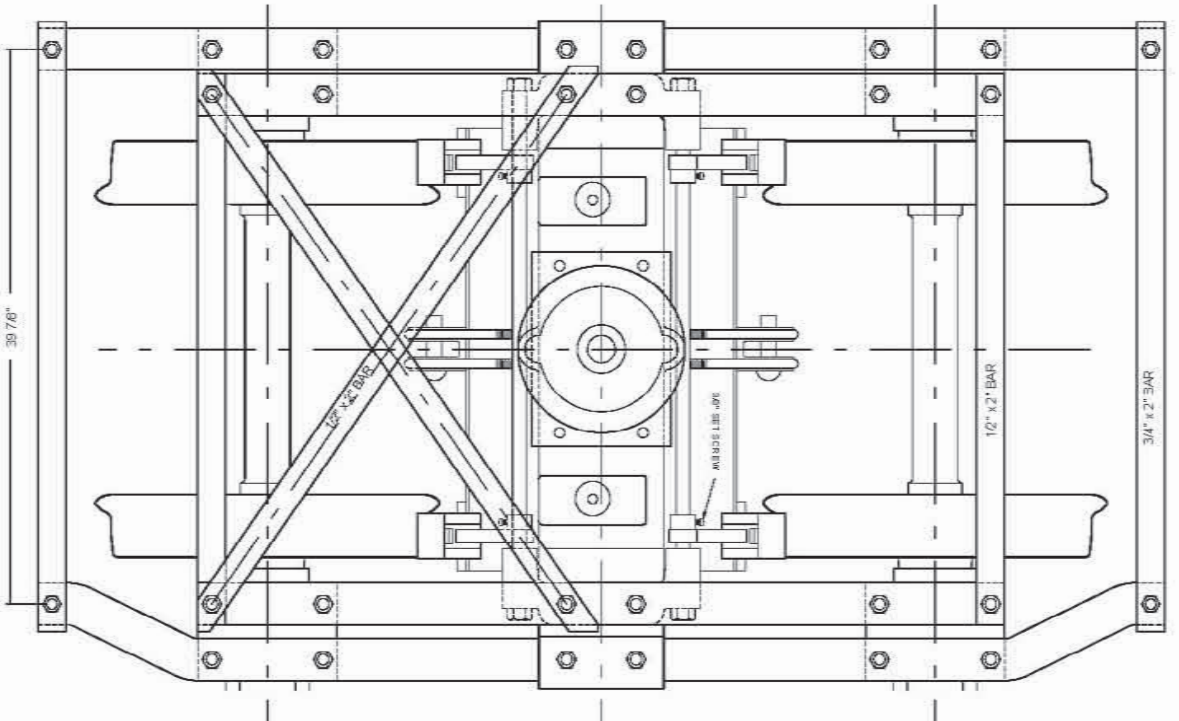


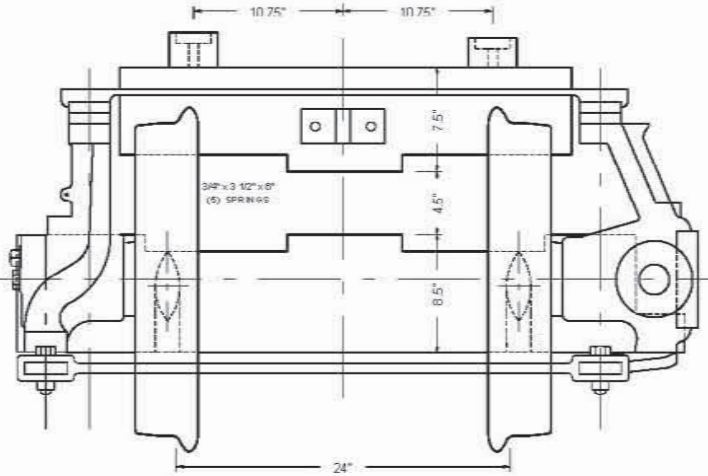


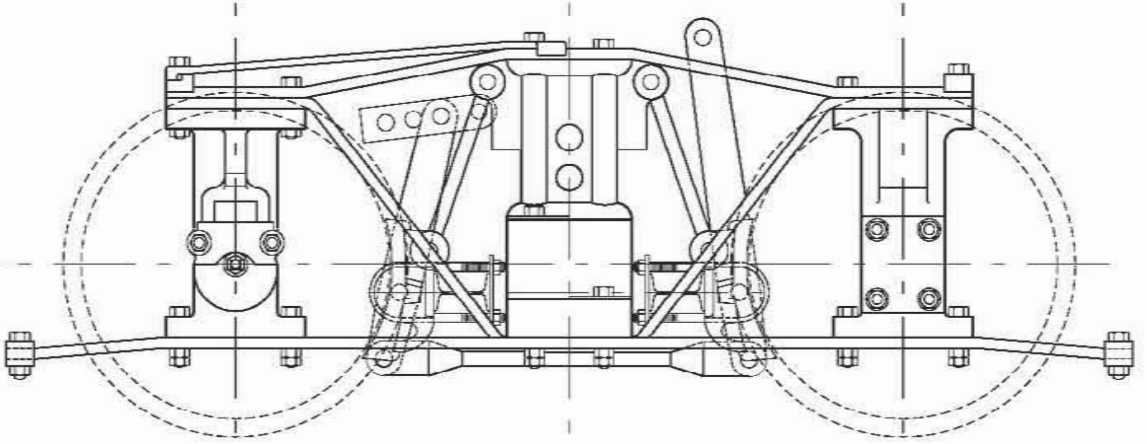
9820 Patt 5268

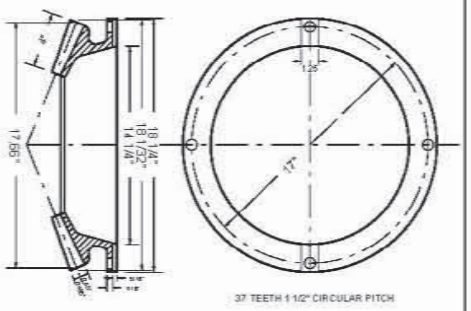


9807 Truck Brake Rods



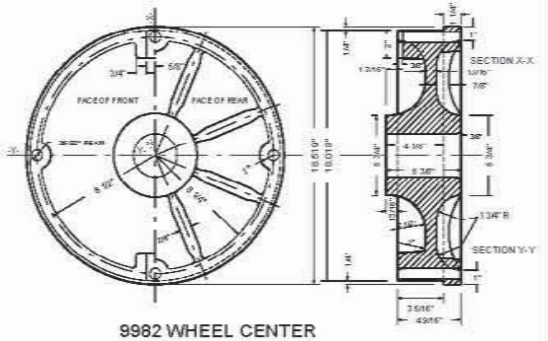




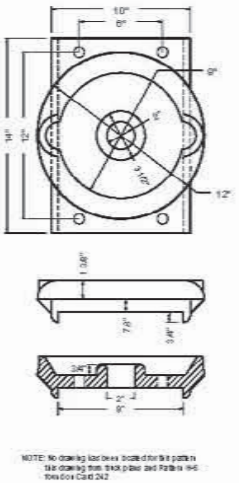


37 TEETH 1 1/2" CIRCULAR PITCH

742-A-5116 #17 GEAR

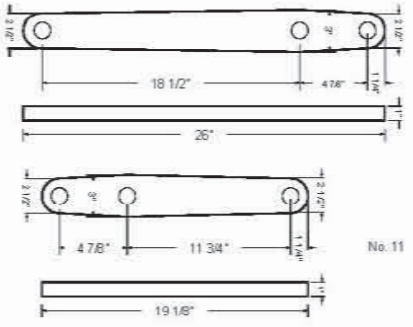


9982 WHEEL CENTER



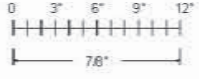
NOTE: No drawing for boss located for this pattern. Use drawing from track plate and Pattern H-6 Iron Box Card 242

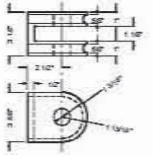
PATTERN H-6 1/2



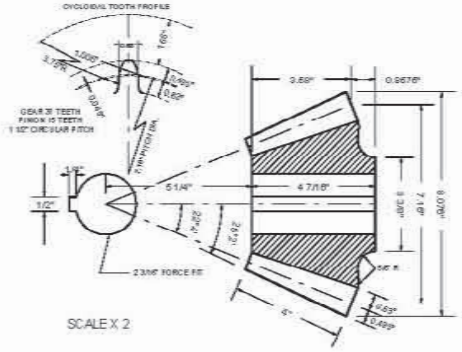
9809 TRUCK BRAKE LEVERS

SCALE 7/8"=1'



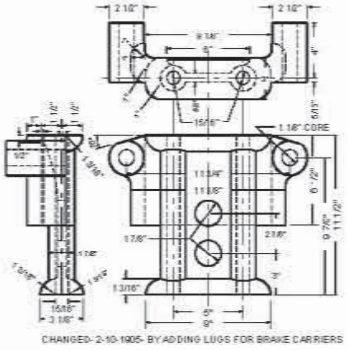


9801 Patt. 5272



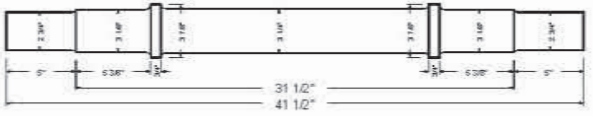
SCALE X 2

742-A-5114 #17 PINION

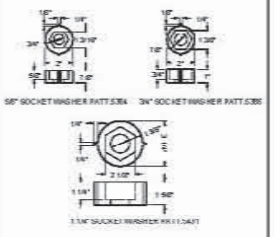


CHANGED- 2-10-1905- BY ADDING LUGS FOR BRAKE CARRIERS

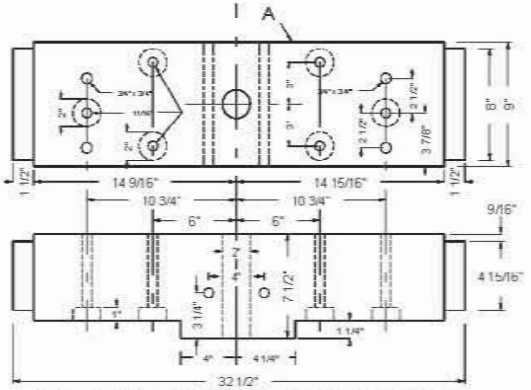
CARD 3165 COLUMN FOR 2-6x10 TRUCKS



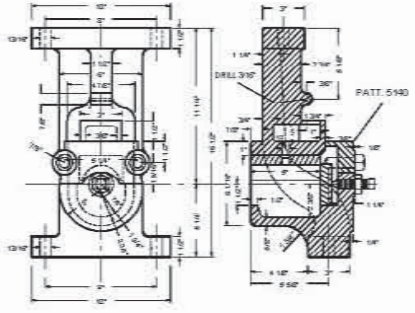
10213 AXLE No 49



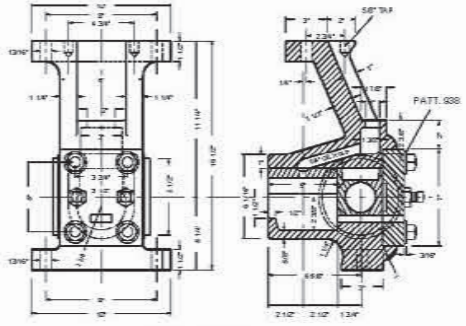
10337 SOCKET WASHERS



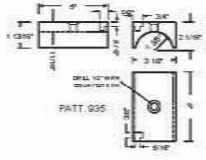
HOLES FOR SIDE BEARINGS AS SHOWN ON FRONT TRUCK BOLSTER
LAYOUT FROM SIDE "A" FOR REAR TRUCK BOLSTER

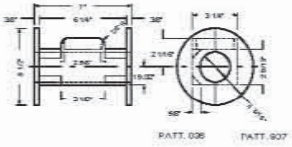


BACK BOX PATT. 934

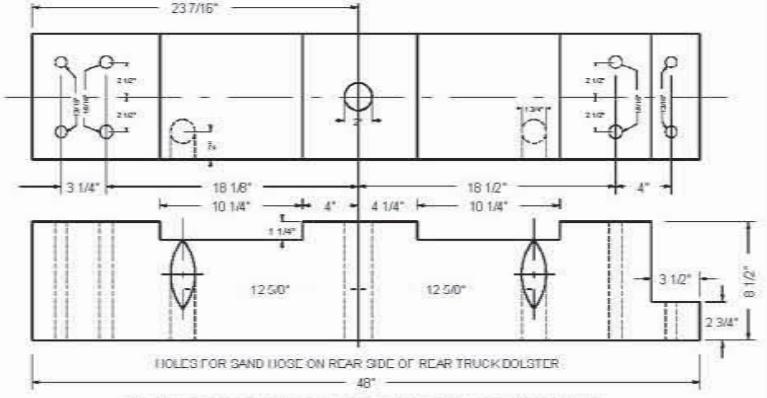


FRONT BOX PATT. 933





CARD 235



HOLES FOR SAND HOSE ON REAR SIDE OF REAR TRUCK BOLSTER

SET NO 2 FOR 23 5/8" GAGE STEEL RAIL FOR TRUCK CD 16006

9521 TRUCK BOLSTERS 2-6" x 10" LOCOS

A Live Steam Whistle

by Gerald Pierce
Asheville, North Carolina

Some Locomotive Whistle History

The first use of a "steam trumpet" was in 1832 on the Leicester and Swannington Railroad in England. The early whistles were used to give warning of an approaching train and to communicate with rail workers.

Whistle types, and the sounds produced by locomotives varied by railroad from the shirker to the deep tone hooter. Also, some railroads had multi-chime whistles. The most copied train whistle in the US was a six tube design by Casey Jones of the Illinois Central.

Whistle codes were developed to communicate with train workers both on the train and in the yards. The codes were a sequence of long and short sounds. The codes varied by railroad. Examples are as follows:

One short: Apply brakes, Stop
One long: Approaching station, crossings
Two long: Release brake, proceed
Three short: Backing up
Series of short toots: Alarm

One area train was named after the sound of its whistle. The East Tennessee & Western North Carolina was a narrow gauge railway which operated in the Appalachian Mountains. The ET&WNC was dubbed the "Eat Taters & Wear No Clothes" by mountain humorists. Also called the "Train with a Heart" because passengers were allowed to ride free during the Great Depression. But the Tweetsie is the name by which it is best known today. It was called the Tweetsie because of the shrill "tweet, tweet" of its whistle.

Locomotive whistles often were as used as important safety devices. Nearby is the steepest standard-gauge mainline railway in the United States. The Saluda Grade is owned by the Norfolk Southern Railway. The Saluda Grade consists of a three-mile section of track with a grade of 4.7%. The line experienced numerous runaway train accidents in the late 1880s. A special safety track was built along the route with a manned spur junction. The switch is always open to the safety track with a 60-foot pile of solid earth which can stop any runaway train. The signalman will only throw the switch to the main line after the train engineer issues a special whistle signal.

Whistles can be found in American folklore, songs and movies. Who can forget the noon train whistle from the movie High Noon. If you want to hear it, go to YouTube.com, Original Train Sequence.

The above historical information was obtained from the web site Wikipedia. This site has an abundance of information on locomotive whistles.

My Prairie

I built a 2-6-2 Prairie based on a design by Paul Kenney. This design uses the Roundhouse Lady Anne 0-6-0 Walschaerts Valve-Gear chassis and boiler kits. I added R/C control for the steam regulator and reversing rod. The R/C uses the RCS system with JR 331 micro servos. One advantage of Paul's design is that the cab interior is large enough to add three servos and a whistle valve.

There are several whistle valves sold by suppliers of fittings. However, these did not meet my requirements. I designed my own valve to fit in the cab. I could use the boiler level plug bush for a steam source.

Whistle Valve

The valve is made from hex brass with a union fitting for whistle supply tube. A pushrod forces a rubber ball off its seating to release steam to the whistle. The ball has a return spring to stop steam release. The servo horn is not connected to the pushrod, it just rests next to the round end of the push rod. This allows the valve to be operated by the servo or by pushing the rod with your finger.

The drawing shows an extension which screws into the boiler bushing. This is not needed for the whistle. It was necessary to align the whistle with the servo.

A 1/8 OD tube fitted with a cone and nut attaches to the pushrod section then on to the whistle. I added a tee with a 1/16 tube to a dummy whistle atop the steam dome. When the whistle valve is operated, a small jet of steam comes from the dummy whistle. The whistle sound appears to come from the dummy whistle atop the steam dome.

An additional item I just added is a boiler refill check valve, which is part of the spring and ball section. Since I did not test it yet, it is not included in this article.

Whistle

The whistle design is based on the standard single note tube whistle shown in several books on small live steam locomotives construction. A good discussion on whistles is in ***LBSC'S SHOP SHED & ROAD.*** This book was first published in 1929. It covers several whistle types including the chime whistles and an extra deep-tone whistle using a resonator-box.

The whistle is made from 7/16 diameter thin wall, (.014), brass tube about 4 inches long. At one end is a cap with screw fitting to attach the whistle under the running board. The other end has a union fitting for the steam supply tube. The whistle opening is filed to shape as shown on the drawing. Turn a 3/16 thick brass disk a tight push fit in the tube. File to shape as shown. Push into tube until it aligns with the filed out section per drawing. Solder the end caps and filed section into the tube. Just use a very small piece of solder. I used Stay Brite silver solder with the liquid flux for this. Stay Brite melts at 430 degrees. Do not use paste flux with the high temperature silver solder as you may melt the brass tube.

Mount the whistle with the open section pointed down and lower than the sealed end to allow condensation to drain out. The whistle works best after the boiler is hot and the water level has decreased a little.

Whistle Tips

If you have used the Roundhouse Lady Ann chassis and boiler kits to make a similar locomotive, my design may work for you. If not, I will give some tips as how to proceed with making and installing an R/C live steam whistle.

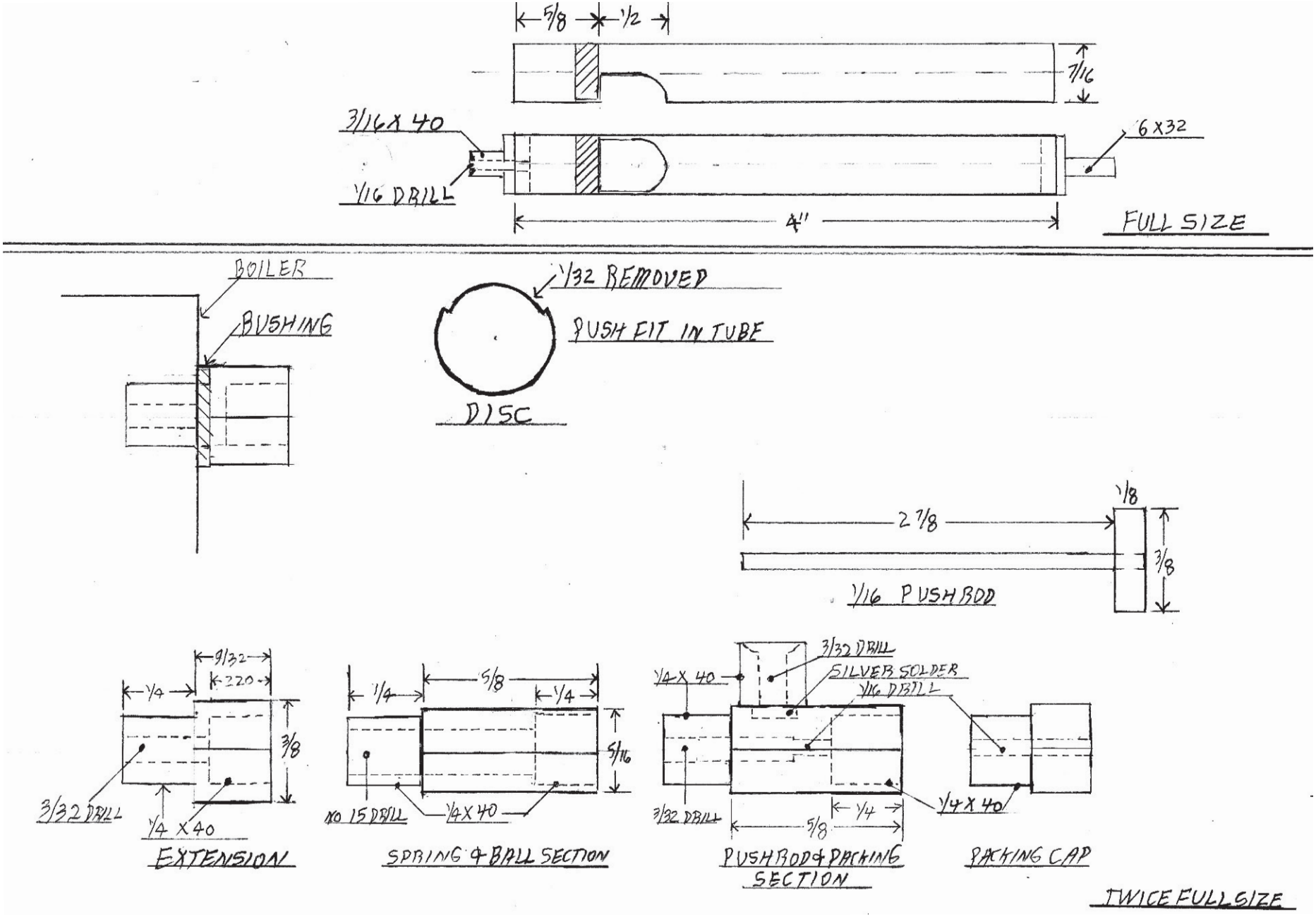
First you need a steam source. If you don't have an unused boiler bushing or steam manifold you may have to tap into the steam regulator valve. Silver solder a threaded fitting for a cone and nut for a small tube.

Next you need a valve stand to support the valve with room for the servo. The valve possibly could be made smaller if necessary. Do use a rubber, not metal ball. With these small boilers we don't want any steam leaks.

Then you can make the whistle and mount it under the boiler or running-board. Make the valve first as you will need it to test the whistle before it is mounted.

The single tube whistle can be tuned by use of a sliding plunger. Before the end cap is attached, insert the plunger and test with steam. Slide the plunger up and down the tube until you get a good sound. Then cut the end to length and solder on the cap. Make your test using live steam from the boiler. I did not tune my whistle.

When you get the valve and whistle finished then a servo should be added. With R/C control of the train and whistle you have more realistic operations along the route. You can use the whistle codes to "talk" just like the real trains.


5/8
1/2
7/16
3/16 X 40
6 X 32
1/16 DRILL
4"
FULL SIZE
BOILER
BUSHING
1/32 REMOVED
PUSH FIT IN TUBE
DISC
2 7/8
1/8
3/8
1/16 PUSH ROD
9/32
#20
1/4
3/8
3/32 DRILL
1/4 X 40
EXTENSION
1/4
5/8
1/4
5/16
NO 15 DRILL
1/4 X 40
SPRING & BALL SECTION
3/32 DRILL
SILVER SOLDER
1/16 DRILL
1/4 X 40
3/32 DRILL
5/8
1/4
PUSH ROD & PACKING SECTION
1/4 X 40
PACKING CAP
TWICE FULL SIZE

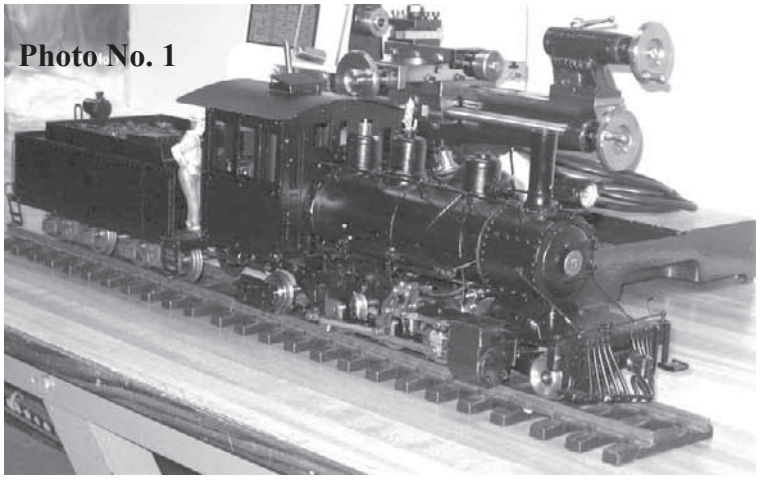


Photo No. 1

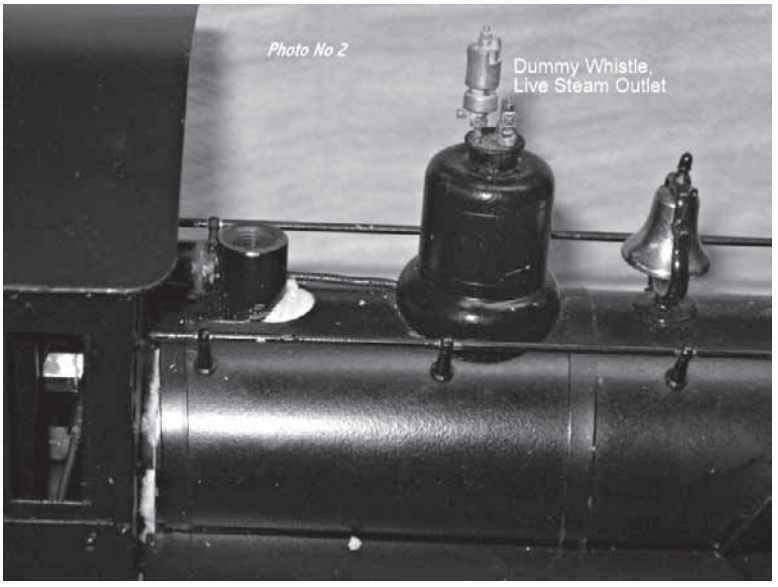


Photo No 2
Dummy Whistle,
Live Steam Outlet

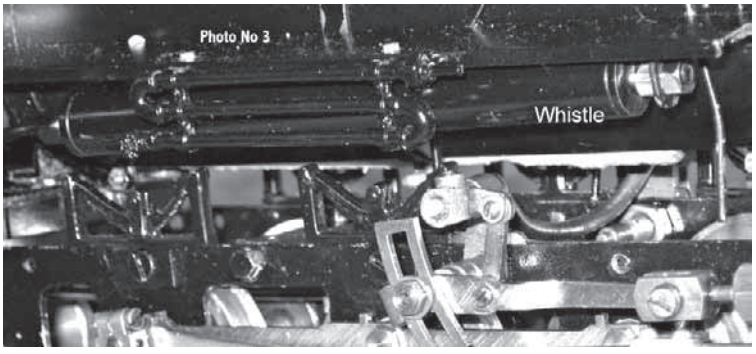


Photo No 3
Whistle

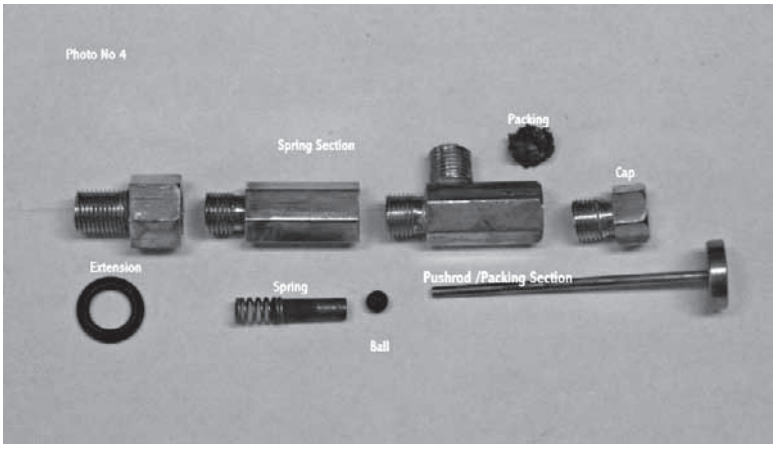


Photo No 4
Packing
Spring Section
Cap
Extension
Spring
Pushrod /Packing Section
Ball

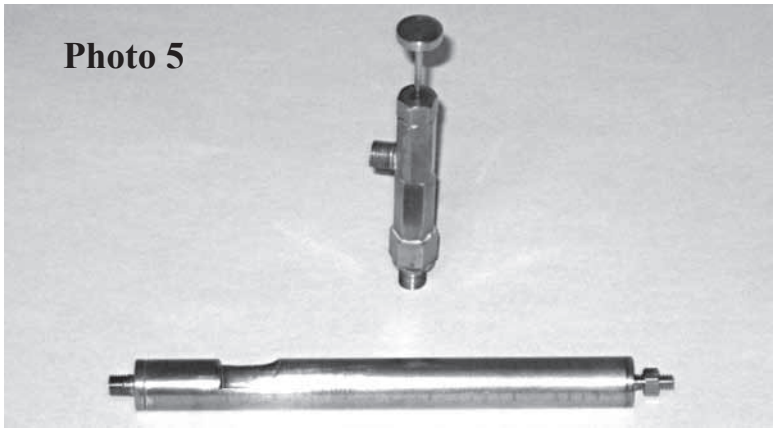


Photo 5

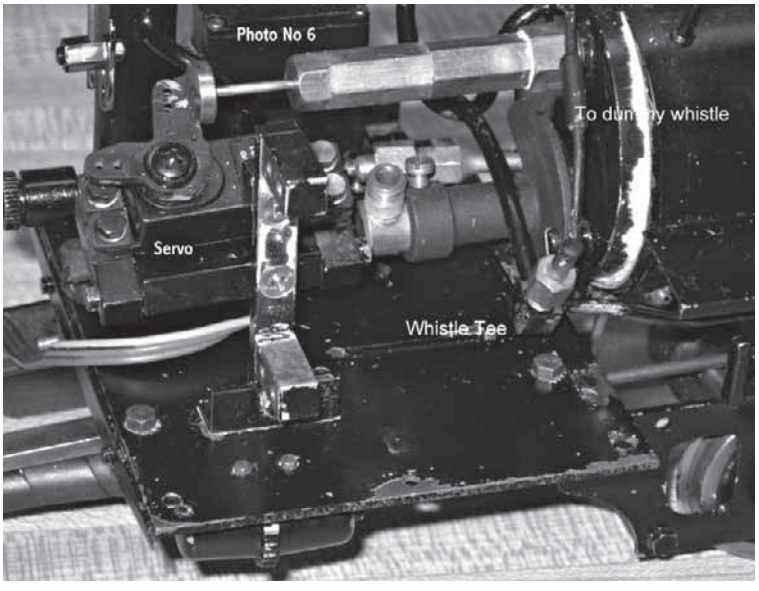


Photo No 6
To dummy whistle
Servo
Whistle Tee

Photo 7

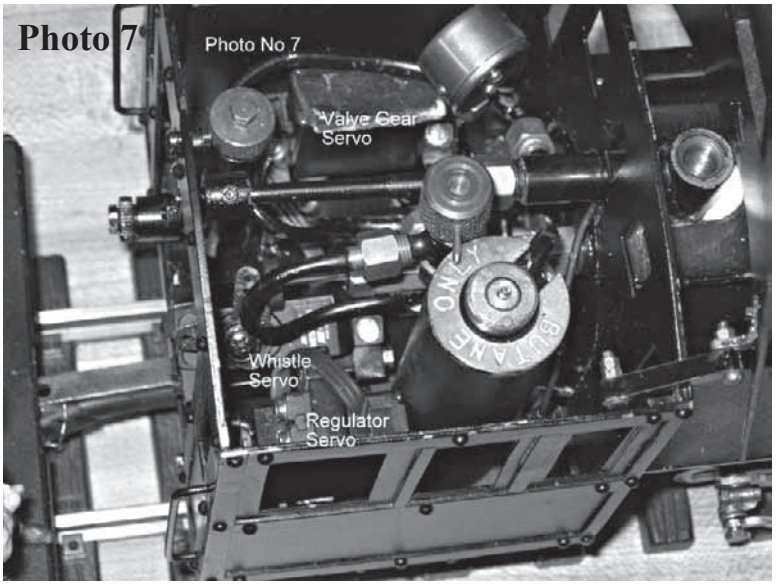
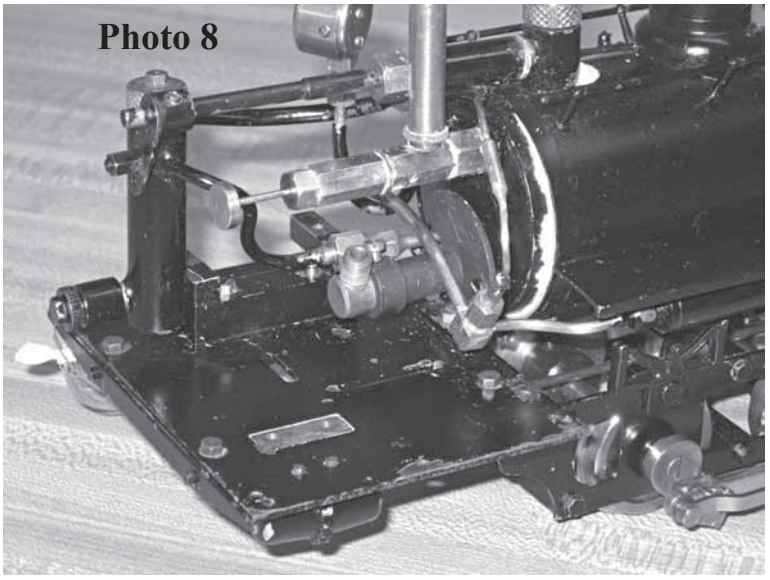
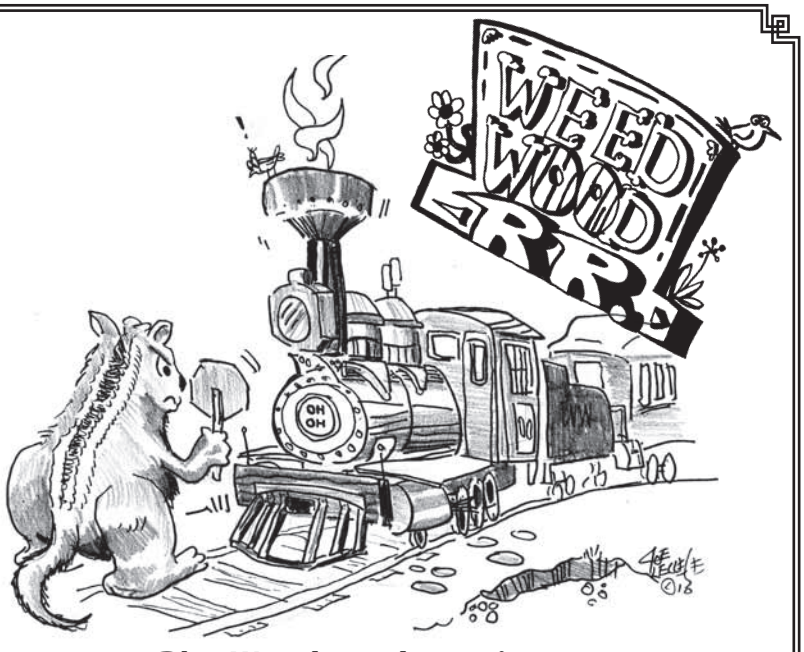


Photo 8





The Weedwood survives
"The Great Chipmunk Revolt of 2010"

continued from page 25...

with the throttle, water gauge glass, burner, etc.

With the breakdown of the donor locomotive complete it was time to make a full size mockup of the proposed locomotive. I was lucky to have in my collection a copy of the Railroad Model Craftsman article from the November, 1975 issue on the EBT 2-8-2s, complete with a 2 page center spread drawing of #s 14 and 15. I took this to my local copy shop and had a full size copy made to 1:20.3 scale which was a 237% enlargement.

As it turned out the driver wheelbase was pretty close to the prototype. However it became obvious that I would have to make a frame extension at the rear to support a proper size deck and cab, I mocked up the new cab out of cardstock and determined the length of the frame extension. The extension was fabricated from brass bar stock. It is fastened to the Aristo frame using 2-56 hex head bolts. With the extension in place I could see that I would have room for the reversing servo under the new deck and between the frames. The servo was mounted using a fabricated brass bracket and an R/C model airplane push rod to the existing reverse lever rod. Prior to this I had removed the Aristo reversing motor assembly. It just seemed easier to use a standard HiTec servo (HS-85BB) rather than attempting to adapt the Aristo reversing system to function properly with the Spektrum receiver that I have standardized on for all of my live steam locomotives. With the rear deck in place I fabricated a new boiler mounting bracket and turned my attention to the smokebox and the front deck/pilot assembly.

Consulting the full size plan I determined the length and diameter of the smokebox. It was fabricated from a piece of thick wall aluminum tubing on the Sherline lathe so that the boiler was a tight sliding fit in the smokebox so as to allow for expansion/contraction during operation, as the rear of the boiler is securely fastened to the cab deck. The smokebox saddle was fabricated by using a piece of square brass tube that was cut/milled to size. The smokebox door was turned to size from an aluminum blank. A turned brass stack and some Trackside Details parts completed the assembly.

The pilot deck assembly was made from a piece of 1/16" CRS with a suitably sized brass bar for the pilot beam. Trackside Details steps, pilot, etc. completed the assembly. This was bolted to the frame with 2-56 hex head bolts.

With the front and rear decks completed I turned my attention to the boiler. I made four rings from thick wall aluminum tubing to shim the boiler out to the correct diameter. The jacket that all the detail parts attach to is made from .025 half hard brass rolled to the correct diameter. Tabs with nuts and bolts hold it in place on the bottom. The domes are from Accucraft. They looked to be the correct size when I looked at the illustrations on their website. Upon receipt it was clear that they were too tall for this application. I ended up chucking them in the lathe and removing a bit of the center section using a parting tool which brought them down to the correct height. J-B Weld was used to join the tops and bottoms back together. By this time I had decided not to use the Aristo safety valve arrangement that takes the blow-off steam and causes it to exit behind the cylinders at ground level. In its place I machined the brass boiler plug to accept a Roundhouse Engineering safety valve.

The remainder of the boiler details are castings from Trackside Details. The handrail posts are from Roundhouse Engineering. These are the posts that they use on the SR&RL #24 model. The handrails are 1/16" diameter K & S brass tubing with the headlight wire(s) running through them to the cab, where a battery and switch are located.

At this point I could mount the boiler to the chassis. Looking at the loco it was clear to me that way too much daylight was evident under the boiler. It was then that I realized the Aristo chassis did not have any driver spring hanger detail. A quick order to Precision Scale yielded eight spring hanger castings in brass. With some filing and drilling the castings were mounted on the frame above the drivers and the daylight issue was solved. The boiler now appeared to hunker down on the frame in a suitable narrow gauge manner.

Now it was time to fabricate the cab. This was done using .025 brass sheet stock. The window and door locations were milled out and rivets embossed using the automatic center punch method that Vance Bass wrote up some years ago in Garden Railways magazine. A quick soldering job and the cab was together. A Trackside Details roof vent hatch completed the assembly. At this time I mounted the throttle servo using a bracket fabricated from brass and sized to fit the location. I did not use the Aristo dead leg lubricator that was originally mounted on the fireman's running board. I'm a fan of the simplicity of the Roundhouse Engineering displacement lubricator that never leaves gobs of oil all over the engine.

At this point the project was really starting to

come together. It was time to tackle the tender. It was made using brass bar stock for the underframe and end beams. This was bolted together using 2-56 hex head bolts. The tender tank itself is .025 brass that was jig bent and rivets embossed as described earlier. The tender contains the R/C receiver, battery pack, and gas tank. It is my standard practice to have the gas tank sit in a heated water bath. A steam line runs from the boiler backhead, thru a silicon hose, to a heating line in the water tank. The tank is simply a sheet brass box soldered together and caulked with silicone bath caulking to make a leakproof container. The heated water bath allows running in cool weather with no loss of gas pressure. Trackside Details castings and a Kadee #1731 coupler box completes the tender.

With construction completed it was time for painting. I primed the loco and tender with self etching spray can primer from my local auto parts store. The final finish is Rustoleum Brand Hard Hat high heat black spray can paint. I like the medium gloss of this paint and have had many favorable comments on the color and sheen. It doesn't quite match the chemically blackened Aristo frame and drivers but its OK with me. Maybe a little weathering in the future will help blend the two together. The lettering is Woodland Scenics press & apply railroad roman letters.

I'm happy to report that the loco is a smooth runner and I'm very pleased with how the conversion turned out. I believe that this is the first Aristo mike to narrow gauge conversion. I would like to see what other folks are doing with their locomotives. Send Ron some pictures to share with us all. My next project will be an Accucraft USRA 0-6-0 that will become a 2-6-0. Stay tuned!

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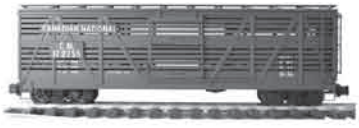

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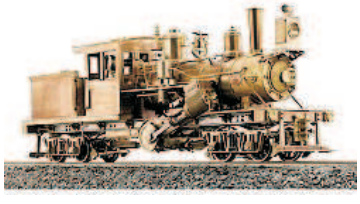

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