The NEMES Gazette

Vol 06, No 062
June-2001

The Newsletter of the New England Model Engineering Society
Ron Ginger, President, 17 Potter Road, Framingham, MA 01701, Ron.Ginger@Compaq.com
Rob McDougall, Treasurer, 357 Crescent Street, Waltham, MA 02453, RCMcDougall@MediaOne.net
Kay Fisher, Editor, 80 Fryeville Road, Orange, MA 01364, Kay.Fisher@Compaq.com
Bob Neidorff, Publisher, 39 Stowell Road, Bedford, NH 03110, Neidorff@TI.com

Our next meeting is at 7:00 PM on Thursday 7-Jun-2001 (first Thursday of every month) at
The Charles River Museum of Industry
154 Moody Street
Waltham, Massachusetts

Annual dues of $20 covers from Jan to Jan. Please make checks payable to NEMES and send to our treasurer. (Address in masthead).

Missing a Gazette? Send mail or email to our publisher. (Address in masthead).

This Months Contents

The Editor's Desk

By Kay R. Fisher

I had a dream recently. Someone asked what kind of things makes a club like ours die. I had a long list of detailed answers and thought it might be worth sharing. Between then and now (when I am actually typing it in) I'm not so sure I can reproduce my elegant (in my dream) reply.

1) Fighting amongst the officers. I've seen this destroy other clubs. If the officers start finding fault with each other and vocalize it, only bad things can come of it. We have been very lucky in that area. What seems to be working for us is respect among the officers. I haven't heard one word about "so and so" does nothing while "I" do all the work. In addition, there are very few complaints from the members. In fact, as the previous treasurer and now editor I have had a constant stream of "thank you" compliments from the members. So when you pay your dues to our treasurer – tell him you appreciate his work. When you attend our show - tell our president how you appreciate his work setting it up. When Max arranges for a speaker – tell him…

2) Boring meetings. When members know in advance that the entire meeting will be about something they have no interest in they will not attend. Fortunately in addition to excellent speakers we have always had some "show and tell" and other

unpredictable events occur at our meetings. I worry about the times that we don't have time for all the show and tell. If someone brings in a project we should make sure it gets a time on stage for presentation. If we run out of time, I hope the project owner is persistent enough to keep bringing it back until we all can see it. I for one look forward to any and all "show and tell" presentations.

3) Lack of volunteers. We have been very fortunate from the beginning with Ron Ginger stepping forward as our president and with many others helping when needed. Ron will talk about our election of officers. I hope that we will always have a continuous stream of volunteers that will fill any key positions as needed. If not we will be in trouble. Stephen Lovely stated at the last meeting that he would like to get out of being the secretary. If you can do this job please step forward. NEMES needs YOU!

4) Burnout. OK – this will hit home for everybody. There are times in every model engineer's life when he just doesn't make anything in the shop for a long time. When was the last time you were doing something in the shop? For most of us I hope that was last night. If not you might be in a burnout situation. There has been a lot written about how to overcome these slumps. I think the best answer is to attend a show and get new ideas and get excited again. Our February NEMES show, the Detroit NAMES show and the Cabin Fever Expo in Reading PA are great motivators. Many of the local shows listed in our "Calendar of Events" section are worth attending. Been to a show lately?

5) Newsletter difficulties. I had to add this, didn't I? Some clubs don't have a newsletter. Most don't have one as good as ours. The newsletter is based on input from the members and can only be as good as its input. This month I am fortunate enough to have received lots of newsletter input. I live in fear that one month there just won't be any. If you're busy on a project please consider taking a few pictures and some notes for possible inclusion in a future newsletter.

Kay

The President's Corner

By Ron Ginger

Meeting Notes

As I mentioned a few months ago, the Museum has asked us to enforce a policy of locking the main entrance door once our meeting is started. Since there is no one to monitor the door, this is a reasonable request. We will be locking the door by about 7:15. If you arrive later than that you may enter through the Internet Center, (the door just before you reach the Museum).

The back door, by the loading dock, will also be locked. Keep in mind there is NO parking allowed in that area. You may enter through that door if you are parking back by the Railroad station, but DO NOT park in one of the building tenant spaces. We will lose our ability to hold meetings here if the building management finds our cars parked in that area.

If you leave the meeting before the end, please ask someone to follow you to the door to re-lock it after you leave.

The Sound System

Let me recap the whole sad story of our sound system. As you may recall we bought a system to use for our meetings late last year. We used it for 2 or 3 meetings and it was working well. Sometime after our annual show the system disappeared from the Museum. The Museum staff has followed a number of leads, and looked in all of the possible places it might have been moved to, but it is now apparent it is gone.

The club has insurance, and the Museums insurance has a deductible larger than the value of this equipment. Rob has been working with Karen to resolve this, and Karen has generously offered to split the loss with us.

Rob is working to replace the system; hopefully we will have it by the next meeting. We will also have a secure storage area prepared before we leave the new equipment.

I regret that we have to sustain this loss, but it is clear to me that the two most important uses for our club funds are the conduct of meetings and the distribution of our newsletter. It is simply unacceptable to hold meetings when all the members cannot hear the speaker.

Summer Show

For the past 3 or 4 years we have had a show in conjunction with the North Shore Old Car club on the first Sunday following Labor Day. We will be holding this show again, so mark your calendars now and plan to bring some interesting models for display.

Here is a chance to see some of the bigger work we do. Last year Dick Boucher brought his recently built CADDigger backhoe, and although we didn't dig any holes on the fairgrounds, we did get to see the machine in motion. This is a very good event, they have supplied us a nice tent for shade, and the rest of the show is also great fun to see. Not only do you get into the auto show free, you get to look at the big auto flea market, and have a chance to see some of our noisier models running.

Election of Officers

We do try to keep the formal club business to a minimum, but we are a legally chartered club, and we do have bylaws that require us to hold an annual election of officers in the June meeting. Mike Boucher made a call for nominations at the last meeting and will ask again at the June meeting before we hold the vote. Right now the officers are:

- Pres: Ron Ginger
- Vice Pres: Steve Cushman
- Secretary: Stephen Lovely
- Treasurer: Rob McDougall
- Director At Large: Mike Boucher

Stephen Lovely has requested that someone else take his place. We're looking for a volunteer.

Ron

Random Ramblings

By Max ben-Aaron

Modern Magnetic Materials

AlNiCo magnets were developed and were made commercially available in the 1940's. They have the lowest resistance to demagnetization of modern products, but the best resistance to temperature effects of all magnetic materials. AlNiCo can be used in environments up to 1,020 ºF, and also in applications needing stability across wide temperature ranges.

AlNiCo is an alloy of aluminum, nickel, cobalt and iron, but different grades of AlNiCo also contain other elements to enhance magnetic properties. AlNiCo magnets are generally formed by casting molten alloy or pressing and sintering fine powder. Either form can be cut and ground to precision sizes.

Rare-earth cobalt magnets became commercially available in the late 1960's. They offered a significant jump in magnetic energy over the ferrite and AlNiCo magnet materials then available. The most common rare-earth element used is samarium.

Samarium-cobalt (SmCo) magnets are pressed into shape from powder and sintered in a furnace, but bonded magnets can also be made from powder mixed with polymer binders. SmCo exhibits excellent thermal properties, offering the

best resistance to temperature for high-energy materials. Several grades are designed specifically for use up to 570ºF.

Sintered SmCo is commonly used in stepper motors for robotics and aerospace, as well as motors for magnetic pumps and couplings. Its high price tends to confine its use to small magnets and thermally demanding situations.

Rare-earth iron-boron magnets made their commercial debut in the mid 1980's. The most commonly produced material is neodymium-iron--boron (NdFeB). Magnequench is the commercial name for a brand of NdFeB. This group of high-tech magnetic materials provides the highest available magnetic energies of any commercial material. It can be formed by both pressing and sintering the powder or by bonding with plastic binders. Sintered NdFeB parts will produce the most powerful products. NdFeB is sensitive to heat; they cannot stand temperatures that exceed 300º F. Although NdFeB is less brittle than some other magnetic materials, it is not robust enough to be used as a structural component.

It appears that a new, higher energy, magnetic material appears about every 20 years. If this pattern holds, we are about due for a new, more powerful magnetic material.

Mb-A

Jim Paquette's Open House

Post-Game Analysis

Mother nature certainly cooperated and gave us a nice day. I hope that everyone enjoyed themselves. Edgar says, "Come back anytime and please bring donuts". I was so busy that I didn't really have time to chat with everyone. I hope that I answered everyone's questions. If you need anything or have any more questions, call me at 508-278-2203 or email me at uxbtoolman@netzero.net. I'm retired so you can generally reach me during the day.

If all goes well, we'll do it again next May.

Jim Paquette

NAMES 2001 Trip Report

By Ron Ginger

Most of you have probably figured out that I really enjoy going to shows. Not only do I get to see some new and interesting models, I get to spend a few days with some very good friends, and generally get to enjoy a good meal or two. This year was no exception.

This was my 11th visit to NAMES. Roland Gaucher and I have driven together to it every year. Norm Jones joined us a couple years later, so I think this was about the 7th or 8th show for Norm. Dave Osier is the new guy; he's "only" been with us 3 years.

We left Rollie's house about 7AM on Thursday. We all agreed to "pack light" this year, but we still managed to have the back end of my minivan loaded just about to the roof. We had a most enjoyable ride across the New York Thruway, little construction, no delays, and no chats with any police officers. We made a brief stop in Buffalo where I was able to introduce the guys to Krispy Kreme doughnuts. Rollie has always been amazed at my ability to find doughnut shops along just about any route we follow. But Krispy Kremes are worth the stop!

We also stopped at Niagara Falls and walked around the New York side park for a while. We made a dinner stop in Port Huron Michigan at a Cracker Barrel Restaurant, where we all had nice low-fat meals, like country fried steak buried in sausage gravy.

We were at my fathers' house just a bit after 8 PM, a mere 13 hours drive.

Friday morning we made our way across Detroit, first passing Production Tool for our annual shopping spree. Imagine the biggest supermarket you have ever been in, but the aisles are filled with things like Locktite, and grinding wheels and Bridgeport Mills, and BIG lathes, and CNC machines, and just about every other form of tool you can imagine.

From there we continued across to Kitts Industrial Tools. You may have seen their ads in Home Shop Machinist. They have a more compact

layout that Production Tool, and more imported "stuff" but we did all manage to find at least a couple things we needed. With a quick stop at Michigan Industrial Shoe for my annual re-shoeing we were finally into Yak Arena about 10:30, and found the place already nearly filled.

Ray HasBrouck had arrived before us and blocked out a few tables, so the NEMES sign was hung and we unloaded the van. Later Rich Puleo arrived, and Howard Gorin was setup as a vendor, so NEMES was well represented.

Of course, as soon as we dropped the boxes on the tables it was off to the vendors to see what was available. All the usual vendors were there, including of course my favorite hustler the Henrob Man! There was a good supply of VFDs, both Norm and Dave bought one, and Dave found a full collet set for his South Bend lathe.

I found a beautiful casting set at Sulphur Springs. This is apparently a knock-off of the Stuart Turner D10 and V10. They are made by an Australian company and were the finest detailed castings I have seen. All are investment cast in bronze. The finish on the raw castings is just beautiful, many of the links and control handles will need little more than hole drilling to be ready to use. The instructions are also well done.

Friday night we stopped for dinner at one of my old favorite hangouts, Sinbads on the river, for a light meal of steaks and fine beverages. We also made a stop to see an old schooner, now lying on the bottom of the river with the main deck just awash. I won't tell this story here, but if you search the Internet for "Man with Blue Dolphin" a song by Stan Rogers, you can get most of the story. Or if you ask me, when we have a suitable cold beverage and time to talk, I'll tell you the rest of the story.

Saturday we were up and back to the show early. The crowds were big and the day was beautiful. There were of course hundreds of models, but a few that really struck me were these:

- George Luhrs again had one of his "I don't believe it" models, this time a 5-cylinder radial aircraft engine with 1/4" bore. The whole engine was not much bigger than a pocket watch. He had 3 of them, 2 assembled and mounted on fine display stands, and one spread out like an exploded view drawing- all 244 parts! Truly an amazing piece of work.
- Bill Chernof (the Shooting Star guy) had his clock almost finished. He left it on our table for a while and I had time to look at it closely. A very nice job, and all self-designed.
- Ron Colonna had his Offy, and this time all the break-in problems were past and this thing just roared at the touch of the starter. He had a crowd 4 deep every time he fired it up. There were 2 or 3 others on display, in various stages of completion. It must be fun for Ron to see these fellows building from his well-written book.
- The EVIC was running too. This is a project to build a simple one cylinder engine, but with a PIC microprocessor to operate the valves by electrical solenoids. I had read of this project on the net, it was good to see it run, and I was able to buy the book with plans and the code for the microprocessor.
- There was a beautiful French Beam engine, all scratch built from a single photo. A very nice job, a rather large engine, about 24" long on the base. What really struck me on this one was the mounting stand. To simulate a tile floor the maker had used a sheet of Corian, of a mostly white but speckled color. He milled grooves about 1/16" wide to represent the tile lines, and had grouted them with a nice white mixture. It looked like he had then done a very soft bead blast over the whole surface to just knock off the shiny surface. This attempt to make scale tiles was about the best I have seen.

There were lots more. The Sherline contest drew 11 entrants and the CNC area had several homebrew machines at work, including the NIST hexapod. All in all, it was a great show.

Saturday night we again dined lightly at the Mack Avenue Diner. Last year when Dave ordered a dessert the whole place stopped to watch it being delivered. This time we went easy on the desserts, but the meals were not what weight watchers would approve!

We were back to the show Sunday, as usual a lighter crowd, but a few new exhibitors arrived, so there were a few new items to see. As usual, the show started to wind down about 3, we were packed and on the road just after 4PM.

We left Detroit about 7 AM Monday, had a smooth and uneventful ride home. By the end of the day Monday we were a tired bunch, but for me it's one of the highlights of my year, good friends, good food, and 5 days of total immersion in things mechanical. I can't wait for next year- maybe I can convince enough more of my friends to join me and we can have the whole bus full!

Ron

The Meeting

By Stephen C. Lovely

The Meeting, 3 May, 2001

Last weekend was the NAMES show out at the Yack Arena, and Ron had a quick report on it, along with a bunch of flyers for next year's show which will be in Southgate Michigan at the Southgate Civic Center on April 27 and 28, 2002. Ron Colonna had his Offy running again, and George Luhrs was there with another impressive miniature engine. This time he's built a 5-cylinder radial engine with a .25-inch bore. He had 2 built and on display. One assembled and running and the second in one of the parts layouts that he does so well. It has 244 parts in it, some of them so small that Ron was unable to tell what they were when he looked at the parts layout.

Ron only bought two casting sets at NAMES. One is an all investment castings set from Australia for a single cylinder steam engine. They are made by Miniature Steam Pty, Ltd. and are available in the USA from Sulphur Springs. Norm had his Mery engine at the show and had it running. It should run better in the future as Norm gets its operation smoothed out.

The North Shore Car Club will be holding its show at the Topsfield Fair Grounds again the first Sunday after Labor Day, which is the same weekend as the Dublin show. NEMES will have a tent there again in a good spot to show the models to the public and it should be a good time for everyone who goes.

There is a big mill engine in South Boston in a building that is getting rehabbed between Harrison and Albany. At one time it ran a shoe mill and there were 8 boilers on line to keep it turning. It has a flywheel that is 12-14 feet in diameter and Bob Cline is going to see if arrangements can be made for NEMES members to go sometime and see it.

One of Henry Szostek's interests is metallurgy, so when he found a nice example of crevice corrosion in stainless steel at the beach he picked it up and brought it in to show us. Stainless steel is corrosion resistant because, when it is exposed to air, a film of chromium oxide forms that coats it and resists corrosion. If something prevents the oxide from forming, such as contamination of the surface or a lack of oxygen, then the stainless steel will rust and corrode like any typical steel. In crevice corrosion like on the barbecue grill Henry brought in, the corrosion starts in the cracks and the salt environment at the beach attacks the iron at the bottom of the cracks where oxygen can't reach and the stainless steel rots out from the inside. The corrosion on the grill was quite impressive; some of the wires had been eaten out until they seemed to be little more than crumbly tubes of corroded metal.

Errol Groff brought in some parts for a South Bend lathe he has been working to repair. It began when one of his students called him over and said, "Mr. Groff I don't think it should be doing this." The play in the cross slide had gone from 2.5 or 3 turns to infinite. Errol checked with South

Bend, but at $1200 or so the new cross slide lead screw was way beyond the budget for the year. As a result he bought a three foot piece of 5/8 8 Left Handed Acme Screw for $30 and made a serviceable replacement to keep the lathe in service. He's going to put some details together and get them to Kay to go into the Gazette.

The main speaker for the night is Stanley P. Gentry, President of Noble Industries in Hibbing Minnesota. Jim Paquette lined Stan up as our speaker after he met him through the sale of one of his steam engines. Stan bought it from Jim via eBay.

Several NEMES members have built locomotive models, and more are under construction now, but none of them can compare to what Stan is undertaking – the building of a 12 inch to the foot replica of a standard gauge locomotive.

Stan was supposed to be coming to talk to us on the last leg of a trip to Washington DC, but the trip to Washington was scrubbed so he came all the way from Minnesota just to talk to us.

Stan owns three printed circuit shops. He's not from a railroading background, and grew up in Nevada south of Lake Tahoe. In the late 1980s, he and his wife decided that they should get a Locomotive to advertise the printed circuit business that they ran in Mason City Iowa.

They did some looking, but couldn't find a locomotive that was small enough for what they wanted. There were locos available but they were too new (and hence big) for what they wanted. They wanted something that could be run on standard railroad tracks, but also something that was small enough to truck to sites far from existing tracks.

Their research narrowed to the Virginia and Truckee Railroad. The first locomotive of the Virginia and Truckee Railroad was the Lyon. Lyon was designed in 1869 but is pretty much 1856 technology. It is named after the first Union general killed in the Civil War. The Virginia and Truckee runs from Virginia City down a 2 per cent grade. Ore went down from the mines, and supplies and such went back up.

A 22 ton 2-6-0 Mogul, Lyon was a bit small for the job it was purchased to do, but it is perfect for the Gentry's needs. It's big enough to be a real locomotive and at the same time is small enough to be trucked about without it being a major big deal. The original Lyon is long gone, but an erection drawing from 1869 exists, and there are 6 photos of it taken in the 1890s just before it was cut up. Stan bought 25 copies of the 3 by 5 foot scale drawing for $5.80 each and the process of building a replica Lyon began.

So, with the decision made to build a replica, what is it that is going to be made? The following quote from a Lyon construction consultant expresses it best:

"The greatest virtue of replicas is their honesty. There is no pretense, no sham, no razor thin qualifications – they are simply and openly fakes." John H. White, Jr. 1992.

The photos of Lyon show a big stack that was a spark arrestor and pipes that were added so the Lyon could be used as a stationary boiler after its days as motive power were over.

The Strasburg Railroad maintains a shop for the care of their locomotives. They agreed to build the locomotive, providing that Stan pay for the construction in advance and that he could convince John H. White Jr. to act as consultant to the project. John White, from Miami University in Ohio, is the writer of many books on locomotives. Stanley was to build the tender for the locomotive himself, and when the project is complete the Strasburg Railroad will have use of the locomotive for 6 months.

The actual construction started after 300 drawings were done between 1991 and 1995. The frames were flame-cut from 3-inch plate, with the cutouts being saved for use later in smaller parts of the engine. The first quote for the frames was for $89000. Each side frame is a single piece. Imagine producing the originals in 1869 from wrought iron!

One of the major questions in the project was what to cast and what to make from weldments. Stan wanted the Lyon to come out as close to original as possible, but to make it entirely authentically would cost an estimated $10,000,000.

The original in 1869 was held together with tapered bolts, and so is the new one. In a properly done tapered bolt, the head never reaches the joint when the nut is tightened. The taper keeps it from going down that far. The cylinder and saddle are cast in three pieces, which was old technology by 1869 when most were made in two castings.

The locomotive "William Mason" was in the Strasburg shops at the same time as Lyon, but Stan is showing us the pictures of Lyon, as he likes his own loco better.

In the original drawing of Lyon it shows the taper bolts going in from the bottom. He tried to make his version of the Lyon match the drawing as closely as possible, but on the new Lyon the taper bolts go in from the top.

The cylinders were cast rather than being fabricated as a weldment. The price on the cylinder patterns was originally set at an open ended $20,000. When they were done the patterns and core boxes completely filled a Luv pickup truck. The cylinders were a 1500-pound pour of iron. The first casting came out with the steam passages 70 per cent blocked by iron and it had to be redone. The problem was that the mold makers had not rammed the cores tight enough so they collapsed too easily when the iron was poured and the steam passages came out partially blocked. The second try, with harder cores forming the steam passages, was a success. As near as they can tell the cylinder that they have built for the replica Lyon is correct to the print for the original. In building the original they have tried to keep all the dimensions to within 1/16 inch of the print. They also figure that this will make the replica as true to the prints as the original was.

The center set of drivers has blind flanges, and the wheels are mounted on 5-inch diameter axles. The wheels were keyed and pressed onto the axles with a 900,000 pound hydraulic press. The final quartering was done while the wheels were mounted in the wheel lathe, using the lathe as a quartering fixture and boring the holes for the crankpins in their final position after the wheels had been keyed and pressed onto their axles.

The wheels were cast at the Fairmont Foundry in Hamburg Pa. Class 40 cast iron was used for the wheels. You couldn't make it out of worse material than was used in the original, and the materials used in the new Lyon are all first class. For example, the tires on the drivers are certified and approved by the FRA. To mount the tires on the wheels they were heated with a propane air mix burning in a ring burner that directs its flame at the entire circumference of the tire at one time so it is heated evenly all the way around. When the tire is hot, it pushes onto the wheel easily.

One complication with the FRA and the Lyon is that the original had no air brakes.

The original Lyon went around Cape Horn in pieces on shipboard to San Francisco and was then brought to the assembly point by wagon.

The new Lyon will be the 8th or 9th replica locomotive built in the United States since 1900 and the first built at the Strasburg Railroad.

To form the throat sheet for the boiler a blank was cut from 5/8-inch plate. Then the plate was heated red-hot and beat with sledgehammers to shape. It worked, but it was a lot of hot, hard work. In the process of hammering, they burnt the handle off of one of the sledgehammers. The original boiler was riveted, but the boiler for the new Lyon is welded. It bears an "S" stamp.

First the boiler is welded and ground. Then it is x-rayed. When it has passed x-ray inspection, the firebox is welded in and it is x-rayed again to check the new welds. Next, the mud ring is flame-cut, machined, and then welded into place.

The crosshead guide rods are 3 inches square, although they are turned round where they fit into the cylinder heads. There is a wedge to hold them into the heads and another slot were the wedge to force them back out of the cylinder goes when it's time to take things apart for maintenance.

There is a Bissell truck for the lead, and the D-valves are lapped by hand.

The chassis is temporarily sitting on planks in place of the springs. The planks act as equalizers at this point and will be replaced by real springs later after the chassis has been weighed so that it

can be determined how strong to make the springs to get the chassis to sit the correct height off the rails.

In the process of making a locomotive that can run today, some changes were needed. Link and pin couplers are no longer acceptable, and safety valves need to be of approved construction. Therefore the Lyon will exist in two forms. When it is in use as a locomotive, the needed changes to bring it up to the standards of the 21st Century will be made. When it is on display, the 21st Century improvements will be removed and the 19th Century originals will be mounted so that the Lyon will be as accurate a replica as possible. One of the items needed to make the Lyon accurate is a Graham's Patent Locomotive Spring Balance. This is a user-adjustable safety valve that allows the engineer to move a lever and adjust the maximum pressure before the safety lets go and vents the boiler. This is definitely not something that you could use today on an operating boiler but something that would add quite a bit to the static display version of Lyon. If you think you could manufacture a Graham's Patent Locomotive Spring Balance for the new Lyon let Stan know. (I've sent him some email and hopefully we'll have a little more on what exactly it is that Stan needs to put into the Gazette.)

The next project that Stan is planning to undertake is a Trolley Park in Clearlake Iowa. It started when he bought a depot from the town for $1. By the time he got it onto it's new foundation he'd spent $68,000 - $7000 of it because they wouldn't let him cross an overpass on the interstate and he had to go an extra 17 miles to get it to its new foundation.

Stan is building the tender himself. There were no prints of the tender, but he does have 6 photos and some drawings of similar and later tenders. The photos show that the wheels are disk wheels, but the original contract says spoke wheels. The wheels in the photo aren't the originals though as they went through a set of tender wheels every six months.

The tender bed is made of white oak. He got a beam from an Alabama flourmill that came from a tree cut down in 1750. He made a bolster out of it and even though the wood has seasoned 250 years it still split. He wants to make it out of single pieces of wood, but oak is tough to work with and takes a long time to season.

The drawbar casting for the tender weighs 460 pounds. The tender is basically oak, with two long iron bolts connection the two ends of the tender together and pulling the weight of the train. Four bolts are typical of the time period and he may use four.

Weldments are typically 1/6 the cost of castings for small numbers of units, so he had the axle boxes made as weldments. He wanted to get an extra made but the guy doing it said eight was enough and he wasn't going to do another one.

Stan thinks that Lyon will be completed in 2003. The people at Strasburg are saying 2004. After it's completed Strasburg will use it for about 6 months.

The original Lyon had Russian Iron boiler cladding. Russian Iron is something that can't be duplicated today. They are going to use stainless steel. First they'll passivate it and then they'll heat it to get approximately the correct color to the metal.

Scl

Web Sites of Interest

NEMES home page

http://www.naisp.net/users/fisher/nemes.html

CADplans corporation (CADDigger home page)

http://www.cadplans.com

The SubCommittee. An organization focusing on submarine modeling, both R/C and static.

http://www.subcommittee.com/

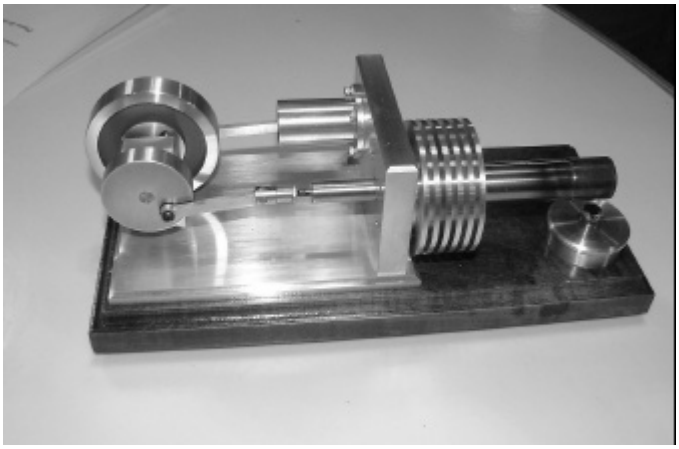
The Strausburg Railroad.

http://www.strasburgrailroad.com/

Show and Tell

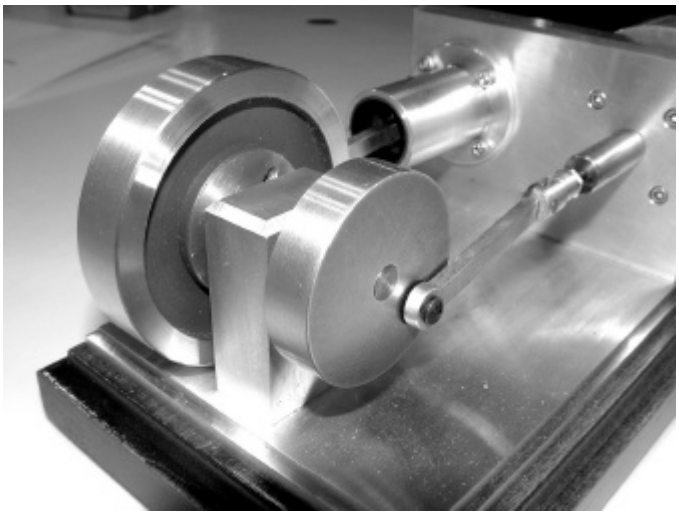
During the April meeting, there were some interesting items for show and tell. Earle Rich got a few good pictures but I had to wait for some info before publishing. Walter Winship and a new member Chris Barrett supplied the missing details.

First is Chris Barrett's beautiful Sterling Engine. Here is what Chris has to say about it:



Chris Barrett's Sterling Engine Photo by Earle Rich

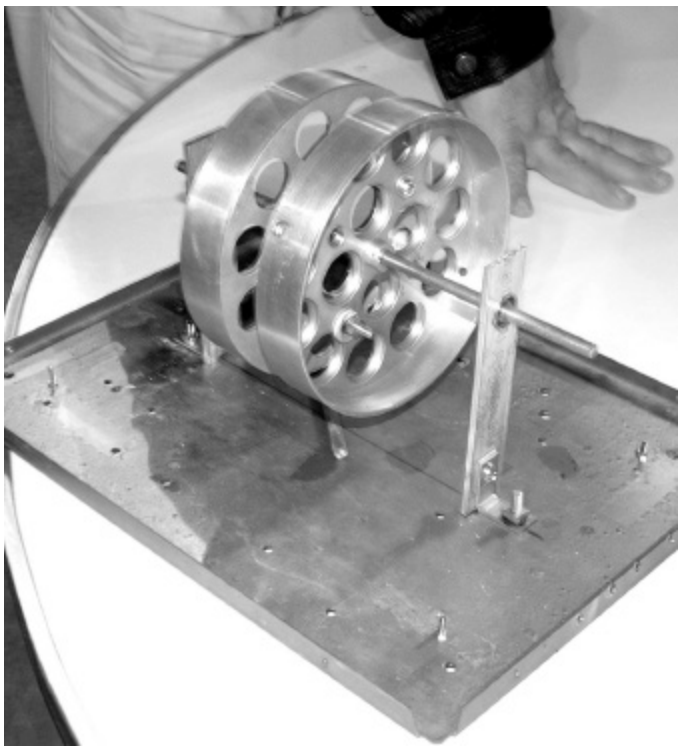
"I made it from plans in a book called "The Stirling Engine Manual" by James G. Rizzo. The engine is called "Dolly" 1.



Chris Barrett's Sterling Engine Photo by Earle Rich

It is a basic Stirling engine that any beginner will enjoy making. I say beginner because that's what I am. As I do not yet have a shop at home I built this engine at work during coffee breaks and lunch breaks. I am getting awfully hungry for food and for more time to cut metal. I wanted to make an engine that would show the basic concepts of the Stirling engine. The engine runs on an alcohol burner and can reach speeds of about 1000 rpm and will run as long as one keeps heat applied to the displacer cylinder. The book say that this engine can be scaled up and can be a basis for research into the various parts of this type of engine and can help the builder understand the principles of thermodynamics. It's a neat looking machine and I enjoy showing it run."

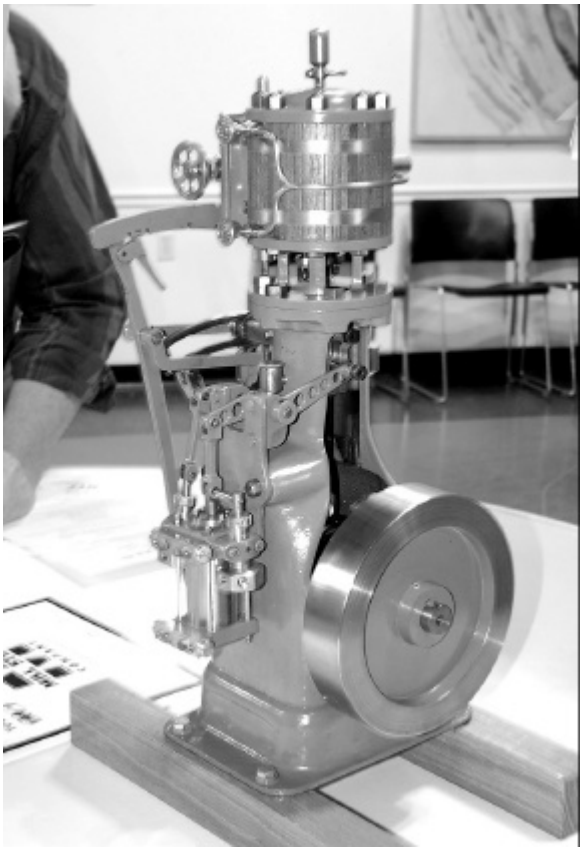
Next we see a picture of a flywheel made by Larry Keagan. He told Chris he wanted to make an efficient flywheel that could spin for a long period of time!



Larry Keegan's Flywheel Balance Photo by Earle Rich

Lastly we see two pictures of a beautiful steam engine built by Donald Hoxie, of Wells Maine. The engine was built from an old single cylinder refrigerator compressor by cutting away the casting and machining to a pleasant shape. He built all the other components from scratch to suit his taste. Ron Ginger said it would be perfect for a steamboat of about 20 ft. and he noted that it has a nice feed pump, and maybe also an air pump driven by links from the crosshead.

Kay



Donald Hoxie's Steam Engine **Photo by Earle Rich**

Donald Hoxie's Steam Engine **Photo by Earle Rich**

Treasurer's Report

By Rob McDougall

As of 4/30/2001

Balance as of 03/31/01:	**$4,439.25**
Dues Received	40.00
Interest Income	1.67
Less	
Gazette expense	-190.84
Balance as of 4/30/2001:	**$4,290.08**

Special Note: On behalf of all members, I want to extend a big **thank you** to Jim Paquette for his generous donation to the club of $100.00. (Will show up in next month's statement.) Jim held his annual Open House/Swap Meet in Uxbridge on Saturday May 19th and many members turned up to feast on the good many offerings of tools and accessories. Most everyone went home with at least one bargain.

Rob

Tips on Chuck Care

By Jay W. Stryker

I have extracted a few points taken from the May 2001 issue of Cutting Tool Engineering magazine, in an article called "No-Fly Zone".

Most model engineers tighten down 3 and 4 jaw chucks to a snug fit. Some might use an extension on the purposely-short chuck key to add torque. However, much of the friction encountered is between the screw or scroll and the jaw teeth, and if that friction is high, the jaw does not move as much as it could, resulting in a loose grip.

A lot of friction at this point can result in a 75% reduction in gripping force, and just adding torque with an extender jams the screw surfaces more but does not slide the jaws. The result is a distorted chuck lightly holding a workpiece. In industry with 10-inch chucks running at thousands

of rpm, this can make spectacular crashes. For model engineers using old chucks at moderate speeds, the problem might result in a mysterious "grabbing" or dig-in and perhaps a slight bit of sliding which might mar the part.

1. Chucks need to be cleaned periodically. Cutting oils and abrasive dusts (especially cast iron dust from that hard chilled outer surface) act as a grinding paste between the scroll and the teeth on the jaws. Aluminum also has an oxidized surface, and anodizing has a thicker one - Aluminum oxide is an abrasive.)

Note also that iron oxide is an abrasive, so if a chuck is rusty on the outside, chances are high that there is rust within and that means more wear.

2. Cutting fluids, especially the water based ones with detergents, remove the chuck lubricants. If a chuck has "tight spots" this may mean that lubrication is missing completely between the scroll and jaw teeth, and/or chips and an abrasive mixture are present.

Oil based cutting fluids also remove the chuck lubricants. If your chuck slings out any gooey wetness upon startup, the chances are good that some of the lubricant has been lost.

3. Oil has no place in a chuck. Oils are designed for a thin film between moving (or rapidly moving) parts under light to moderate pressure. In a chuck these conditions are not found! The speed of movement is almost zero, and the pressures are very high. Oils get squeezed out, leaving a metal-to-metal contact, which makes sticking and galling, and subsequent worn spots.

Note: Oils and fluids designed for motor vehicles should not even be present in a machine shop. These oils contain all kinds of stabilizers and detergents and emulsifiers, which are not good for machine tools. Keep these fluids in a garage and away from the workshop.

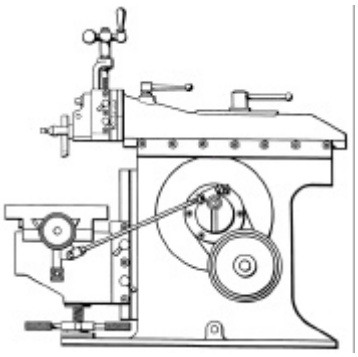
4. Grease is required since it takes the bearing pressures. Molybdenum disulphide grease actually improves with use due to burnishing of the surfaces. Since the 1970s, manufacturers have placed grease nipples on their chucks. Most model engineers probably do not have chucks so new, thus need to open up and clean and lubricate their chucks.

5. Chucks are susceptible to distortion (perhaps cracking) from over tightening parts. When disassembling, use a torque wrench to note torque of bolts; contact manufacturer (if still extant) to get the original specifications.

6. Manufacturers now recommend maximum key tightening torques and may suggest a torque wrench in place of the older style "Tee" handle wrench. The jaws of a working chuck will grip the part securely at the recommended torque and any extra torque only strains the sliding surfaces without sliding the jaws any further.

In short - if you have to really "crank down" to get a good grip with your chuck, it has already lost its gripping power and needs to be cleaned and greased.

Jay



Metal Shapers

By Kay R. Fisher

The most frequently asked question should be: Is a shaper a safe machine? Unfortunately that question is never asked.

Shapers are very dangerous machines. In my opinion they are the most dangerous machine in your shop for several reasons:

- Hypnotism. Shapers are mesmerizing to watch and because of this you find that you tend to just watch in an almost hypnotic state. I suppose you could fall asleep and fall into one but more likely you would just sit there and watch it as it cuts and forget what you should be doing.
- Quiet. Shapers are very quiet. Because of this you tend to underestimate their power. Even small shapers are very powerful. I like to think

of a shaper as an unstoppable force meeting an immovable object. When you start up a circular saw the noise is like a big warning that you are near danger. No such warning when quietly running a shaper. In fact it is easy to forget that you have one running in your shop because it is so quiet.

- Simple. Shapers are fundamentally very simple machines. Because of this, most operators have never studied the manual or read any documents explaining their operation. Don't get me wrong. They are simple and you probably don't need to read anything to run one. But again this simplicity tends to bring with it a false sense of safety.
- Slow. Shapers generally run very slow. This allows you to reach over the ram while it is running (DON'T DO THIS) and clear chips out of the way during the retract stroke (DON'T DO THIS) or tighten up the vice while a work piece is being shaped (DON'T DO THIS) or oil the machine while it is in operation (DON'T DO THIS). In other words it is running so slow that you have a temptation to fiddle with it.
- Switch mounted low. Usually the power switch for a shaper is mounted low. I have my grandson in my workshop whenever I get a chance. If a child should happen to turn on a lathe or mill there would be a loud noise and the mill or lathe work piece would probably be up out of reach. On the other hand, if a child should turn on a shaper the cutter and work piece are way to low for safety and the RAM in going to go through its stroke no matter what is in the way.

So let me leave this safety warning with one good safety hint. The single biggest cause of accidents on shapers is having the tool bit come loose in the tool post. This is because you frequently have to fiddle with them and re-adjust to suit the job. You should treat the bolt that tightens the tool into the clapper box the same way machinists treat the wrench they use for tightening the jaws on a chuck. Always tighten that tool down even though you may not be quite ready and have to do it again.

Kay

Calendar of Events

By Bill Brackett

June 2-3 Dave Dearborn's Engine Show
Dearborn Homestead, Campton, NH
Dave Dearborn (802) 726-3257

June 7, 2001 Thursday 7PM
NEMES Monthly club meeting
Waltham, MA
Charles River Museum of Industry (781) 893-5410

June 9-10 Hinsdale Engine Show
Rt 119, Hinsdale, NH
Douglas Wood (802) 254-6758

June 9-10 Skowhegan Engine Show
State Fairgrounds, Skowhegan, ME
Joe Kelly (207) 862-2074

June 9-10 Granby Engine Show
Dufresne Park RT 202, Granby, MA
George Randall (413) 467-2524

June 10 Rod & Custom Auto Show
Owls Head Transportation Museum
Route 73 Owls Head, ME (207) 594-4418

June 15-17 Father's Day Spring Meet
Pioneer Valley Live Steamers
108 Hillside Road Southwick MA

June 14-16 Coolsprings engine show
Coolsprings, PA
Joyce Bashline (412) 487-1464

June 16-17 Old Stone House Museum Show
Brownington, VT
Pat Warren (802) 723-5472

June 17 Sunday 9AM
MIT flea market Albany and Main St.

June 23, 2001 MASON Launch
Bath Iron Works, Bath ME
Subject to change see http://www.biw.com/

June 23-24 Orange Engine Show
Orange Airport, Orange, MA
Grover Ballou, Jr. (413) 253-9574

June 24th, 2001 Sunday
Bill Van Brocklin Memorial Run Day
Waushakum Live Steamers Holliston, MA
Mike Boucher (781) 893-3892

June 24 Antique Ford Meet
Owls Head Transportation Museum
Route 73 Owls Head, ME (207) 594-4418

July 5, 2001 Thursday 7PM
NEMES Monthly club meeting
Waltham, MA
Charles River Museum of Industry (781) 893-5410

July 7-8 Boothbay RR
Boothbay, ME
Call: (207) 633-4727

July 8 Pepperell Show
Town Field Near Rotary on Rt. 111
Pepperell, MA
Kim Spalding (978) 433-5540

July 8 The Fabulous ’50s & Sensational ’60s Auto Meet
Owls Head Transportation Museum
Route 73 Owls Head, ME (207) 594-4418

July 15 Sunday 9AM
MIT flea market Albany and Main St.

July 14-15 Plymouth Notch Show
President Calvin Coolidge St. Historic Site VT
Bob Williams (802) 525-3931

July 20-22 Bangor Engine Show
Jacktown Community Center, Bangor, PA
Call: (610) 588-7466

July 20-21 Sebago Days
Intersection RT 114 & 11, E. Sebago,ME
Ted Greene (207) 787-2424

July 21-22 Eastern Conn. Ant.Auto Show
Norwich Regional High School-Norwich, CT
Dick Babbit (860) 376-0863

July 21–22 Trucks, Tractors & Commercial Vehicles
Owls Head Transportation Museum
Route 73 Owls Head, ME (207) 594-4418

July 28-29 SubRegatta
U.S. Submarine Base, Groton CT
http://www.subcommittee.com/

July 28-29 Eliot Tractor
Eliot, ME
David Raitt (207) 748-1046

To add an event, please send a brief description, time, place and a contact person to call for further information to Bill Brackett at wbracket@ultranet.com or (508) 393-6290.

Bill

For Sale and Wanted

Enco Lathe

ENCO 9" Lathe - With “Better than OEM” chucks and more goodies - excellent condition at about half the price of new. $465.

Tom Cross (781) 272-1952 Home/Voice Mail

Drill Doctor

Darex Drill Doctor Deluxe (Model 750) Paid $159 asking $100. 3/32"- 3/4" size drill capacity. Comes with extra new unused diamond wheel. See www.drilldoctor.com for details.

Kay R. Fisher (978) 575-0663

Wanted

Does anyone have for sale or know where I can purchase a "BA" thread gauge? The BA standard uses a 47-1/2 degree angle rather than the more common 60-degree angle. I am asking on behalf of John Rex. John is the "magneto man" at the engine shows.

Thanks - Jim Paquette (508) 278-2203
email uxbtoolman@netzero.net