

# The NEMES Gazette

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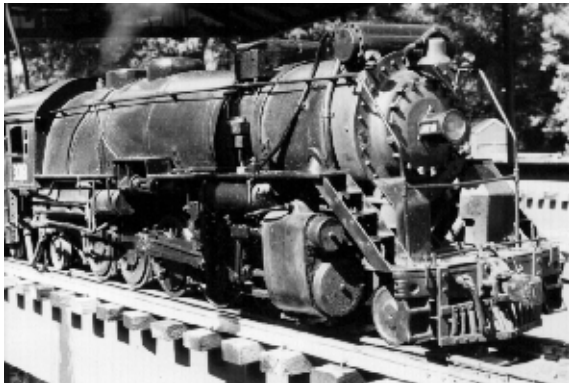
*The Newsletter of the New England Model Engineering Society,  
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## From the Editor's Desk:

I saw Dick Boucher after the last meeting and he said that he'd never been able to find in the newsletter where he should send his dues. So far we've just collected them at the meeting, but if you want to mail them in, send a check payable to NEMES to me at POBox 277, Milford, Ma 01757 and I'll see to it that it get to Joe Masciovecchio, the NEMES treasurer. Counting the people who gave me dues at the August meeting and one that arrived in the mail, we now have 49 paid up members.

Dick also said that he'd like to see a survey of interests and special knowledge that people in the group might have. So, I guess I'll ask right now. What are your special interests in this wide field we call Model Engineering? Do you have any special expertise that you'd be willing to share with the other members? Get the information to me and I'll get it compiled and when there's enough information to make it worthwhile I'll put it in a special edition of the Gazette that'll be a sort of directory of the members.

We talked some about the possibility of putting photos into the Gazette at the meeting last time, and I said I'd look into it. Well, as you can see, pictures are possible using Staples' copy machine as our printer. The quality would be better if we took a more expensive route to get the ink on the paper, but we don't want to break the bank with printing costs. Let me know what you think of the picture, and if people think the quality is good enough to continue using pictures we'll need some people to take pictures for the Gazette. I like taking pictures, but I can't take pictures and keep track of what happens at the meetings at the same time. In case you're wondering about the picture, it's a 3/4" scale locomotive built by George Dimond that I snapped a couple weeks ago at the Waushakum Live Steamers in Holliston, Mass.



Bill Brackett has sent me a set of drawings for a tool post. I'll print them when I get a chance to look them over well enough so I understand them and can be sure that I've got them right. Thanks for sending them Bill. Please don't hesitate to send me in any tips or hints you might have. As I keep saying, what we need to have a good newsletter is information, so don't be shy, write something up and send it in.

I've been reading "Lathe Design, Construction and Operation" by Oscar Perrigo recently as part of my quest to reach the position where I can go out and buy a lathe with some confidence that it will perform well when I get it home and set up in my shop. He has a section on how to inspect lathes quickly and efficiently, but it takes some equipment that I don't have, and I suspect that most of us don't have it. Is there someone in our group who has the expertise and the equipment to be able to conduct the tests that determine what kind of shape a lathe is in? This fits in pretty well with the comments I made above about a survey of interests and expertise. Knowledgeable experts who could provide guidance to the neophytes among us wondering if that machine for X dollars is going to do the job would make a lot of us feel better about parting with our hard earned money.

I've left out the Calendar this month because of space and the fact that I didn't have anything new to put in it. Don't forget our meetings though, the first Thursday of the month at the Charles River Museum of Industry, 7 to 9:30 PM. (That's September 5, followed by October 3 and November 7. Mark your calendars now!)

## Founders Corner

I am very pleased to see the progress of this club. I look forward to each meeting, and can't believe how quickly they pass. I really hate to have to cut off such active discussions to keep us on schedule. I appreciate the kind words from so many of you about the club.

### Steam Expo

The museum's annual Steam Expo is just a couple months away. I hope we can have a very good turnout of our members and put up a nice show for the museum. I have word from Karen that they will be able to supply both steam and compressed air for running models. I don't have any details yet, but I'm sure we will get them. Get busy guys, clean up those steam models and lets have a great show!

### Library of plans and articles.

One of the activities I hope this club can support is a library. There are hundreds of books, articles or plans that would be great to share.

I think we could do something like this:

Members could bring in copies of articles or plans they think might be interesting to others. The club librarian could catalog them, and make 2 or 3 working copies. The master copy could be kept by the librarian, but the working copies would be in a file drawer that is open at each meeting. A member could borrow the working copy, get a copy made and return the working copy to the file at the next meeting.

The cost of making copies can get high, but with this plan the club would only pay for the 2 or 3 working copies. Each interested member could make their own copies. Maybe someday we could get a used copier to have at meetings and then the members could simply make a copy on the spot.

If we really want to go high tech, we could scan the articles, and place them on an Internet server. Then everyone could get them.

One note on copying plans- we need to be careful of copyright issues. I don't want to support an illegal copy of a plan. I think a guy is entitled to make a few dollars selling plans he has developed. But there is a lot of material in old magazines, or old plans now out of print, etc, that would be fair use for a club library.

Well, here is a good start on a very useful club function. All it needs is a Librarian to start doing the work. Any volunteers?

#### Newsletter

I'm sure our editor will be modest to blow his own horn, (and I'll give him hell if he cuts this out of my article!) but I think our newsletter is great and a most valuable piece of the club. Those at the last meeting gave him a big round of applause for his work.

We had a brief discussion about adding photos to the newsletter. Obviously a photo of our Show & Tell items would make a great addition to the newsletter. But Steve already has a very big job just doing the news part, so how about it- is there a photographer among us, that could take a couple black and white pics at a meeting, process them and get copies to Steve in a few days for inclusion?

And while we are thinking about the newsletter, please consider writing something for it. Everyone is welcome to contribute.

#### Swap Table

Paul Gauffin suggested we have a swap table at meetings, where members might want to sell, or trade some items. Everyone seemed to like the idea, with a few obvious practical restrictions (it would be hard to bring in a Bridgeport to swap!) So, if you have some small items to sell or swap bring them along. We will setup a table somewhere for them.

In the same vein, a couple guys brought in some excess catalogs, and offered them to anyone that wanted them. We could make this a regular exchange- if you see something you are interested in, take it home, read it over, maybe order one if

you like it, then bring the catalog back next meeting and pass it along.

#### Next Meeting

Our member Dick Wells, who has already written an article for our newsletter has restored 2 steam cars, a Stanley and a White. He has offered to talk about them at the next meeting. Should be a great talk.

#### Resources:

Don Strang has provided us with a nice collection of businesses for the resources section this month. The first seven are from his personal notes.

New England Industrial Tooling, 75 Webster St. Worcester, Ma. 508-757-8000

Cook McKenzie, Auburn, Mass. 508-798-0100 Joe Johnson, Don Sweet

Cordoza Machinery, 47 Fuller St. Clinton 508-365-6932 Jim C., Chris

Rison Machinery, Plaistow, NH 603-382-5671

Belmetric, 35 Webster Drive, Tyngsboro 1-800-544-1624 - This is a good local source for metric bits and pieces.

Gold Machine, Providence RI South on RT 95 to exit 25, make a U turn onto 95 North to exit 26 go to the end on right. at Thurston and Newell St.

Frank Padykula and Son, Rumford Industrial Supply Inc. 263 Pine St, Seekonk, Ma 02771 1-800-592-5912 Rt 95 to Pawtucket. Get off at the Newport Ave Pawtucket Exit (1 or 2?) Go Right 1 Mile over the RR tracks, 3 lights, left on Central, 1 mile to 152 - Middle of intersection 2 Banks, take middle st which is Pine St, cross the RR, then it's on the right. (Don says this one is better than Brothers.)

The following resources are from a list Don gave me put out by Robert M. Vogel in 1988 listing the dealers in second hand machine tools, tooling, and misc. services that he was aware of then. Since this list is eight years old it's likely that some of the info won't be current, so I'd advise calling ahead before you make a special trip. Also, if you visit any of the places in the resources section, give us all a report on what you found when you got there so we'll all have a better idea if it's someplace that we'd like to be sure to visit next time we're in the area or looking for someplace to go to for an outing.

The list runs six pages, so I'm going to do it in pieces, starting with Massachusetts.

Botwinik Bros. 508-756-5175 2 Sherman St, Worcester. (Off Cambridge St. near Holy Cross) High Quality, no junk. Middling to large Maching tools

DB Cotton (Bennie) 185 Guelphwood Road Southbridge 764-2583 (508 area code ??)

Green Bros. of Worcester, 508-755-8648 60 King St, Box 1438, Worcester, 01601 Harvey and Howard and other

Greens. In 1988 it had a wonderful lot of machine tools, tooling, and more measuring and inspecting items than any other dealer Vogel had seen, along with Good Prices.

Harvard Machinery Loring St, Hudson 508-562-4700 Bryce B. Larrabee, Jr. Mainly a machine shop, but some tooling and the odd machine tool.

Holten Machinery Sales 88 Hoten St, Danvers, 508-774-5941 Mostly Machine Tools. mildly disorganized but friendly. variable prices, some of the stock is elderly if not antique.

Sidney Lonstein 508-892-8026 Box 277, Rochdale (SW of Worcester) Mostly Textile machinery, but occasionally machine tools. Let him know what you want and he'll find it.

RPM Machinery 171 Brookline St., Cambridge 02139 617-547-6503 Tooling only, some instruments. Friendly family operation. no checks, takes VISA

Surplus Tools 100 Felton St. Waltham 02154. 617-893-5633/1553 Large stock of Tooling and Instrument. surplus abrasives. Jerry Freidus

Welch Machinery Box 490, Beverly Farms 01915 508-927-5500 Machine Tools and Tooling. Tom Welch

Young Machinery 27 Congress St REAR, at Pickering Wharf, Salem. 508-744-6457/0670 (I have very fond memories of this place from when I was in high school in the 60's. I spent hours wandering around what seemed like acres of neat stuff that was really cheap, even if I couldn't afford it. I was there 10-15 years ago and it wasn't the same. From what Vogel had to say in 1988 it sounds like it was making a come back with a new generation at the helm.) Bill Young or his mother.

### **Tools and Techniques by Ed Kingsley**

#### **Tool Shed**

Enough of you came by, and stopped in at the Tool Shed (see last issue) before the meeting, that Andy Kotlikoff, one of the partners, has agreed to continue to stay open for us, as long as interest continues. The amount of machinist-type tooling available last month was less than 1/2 the amount I found the last time I had visited. What's for sale depends on what's come in - and that changes daily. He will be open for us, on the 6th, until 6:30. This is a resource we should support. See you there.

#### **Group Buying**

I went to Sears today (Friday), to buy a 2 1/2" hole saw, and was appalled to find it cost \$15.59! I could have bought it at MSC, for \$7.24 + \$5.01 S&H + \$.36 tax, for a total of \$12.61, and gotten it on Monday. But, I needed it

Friday and I bought it at Sears. When they rang it up, 15% was deducted for a Sale that I wasn't aware of. The hole saw ended up costing me \$13.91, inclusive, and I had it Friday. Sale prices make the heart sing, even more so when they are

unexpected. Often as not, we're not even looking for a bargain, so much as we are a 'fair deal'.

We all joined NEMES for the purpose of \*getting something out of it\*. We joined both to share our knowledge and resources with others, and to call on the knowledge and resources of our fellow members when we had a problem.

One of the joys and benefits of belonging to a group, is the advantage that it confers. I offer 'Group Health Insurance', 'CD Clubs', and 'Rental Car discounts' as but (3) useful and well known examples. I'd like to create a mechanism that would allow us to take advantage of buying things in bulk, things that might, ordinarily, be 'prohibitively' expensive to buy as individuals, in small quantities.

Some of those things that come to MY mind are:

- 1) Socket head cap screws - Cheaper by the 100's - but, who needs 100? Wouldn't it be nice to have 10 or 20, each, of \*all\* of the sizes you need?
- 2) Sand Paper- By the 50 or 100 sheet pack, it's 1/2 the single sheet price.
- 3) Those plastic Shear-Loc knobs, that press onto socket head cap screws. You can only buy them by the 100's, and there's 4 shapes and 3 colors. OK, you can buy an assortment, but it costs around \$80, and maybe you don't want the 'L' knobs, in ANY color.
- 4) "Mitebite" work holders - Neat things - only sold in expensive packages. I'd love to have just one pair to try out.
- 5) Metal Stock - Like some Leadloy, Stainless, Brass, Cast Iron or Aluminum in 12 - 24" lengths, in sizes from 1/8" to 2" (or more)? A lot of this stock can only be purchased in long (10') lengths and/or minimum quantities. How many of us need, or can afford 10' of Leadloy rod?
- 6) Tool Steels - Usually sold in 18" or 36" lengths. I'd love maybe 6 - 9".
- 7) Low Carbon Ground Steel Stock - Usually sold in 24" lengths.
- 8) Taps & Drills - Often come in "Package" quantities at good discounts.
- 9) Finishing Materials - Scotch Brite, Sanding Belts, Disks and Sleeves, etc., are usually sold in 'box' quantities.
- 10) Way and Spindle Oils - Usually sold in a 'life time supply' for us, as well as coolant oils, often water soluble and sold in large economical sizes.

Let your NEED be our guide. Lots of catalogs offer discounts for quantity purchases of certain items. It's frequently possible to persuade sellers to offer discounts on multi-unit purchases. You just have to ask. They can only say, "no", but it's often a good thing for you AND for them.

I propose that we establish a "Sign Up" board, to be put up at each meeting, where anyone can post a prospective, 'let's buy .... (?)' Anyone interested in sharing in that enterprise

signs up on the respective sheet, and the post-er is responsible for coordinating the buy and distributing the product(s).

To get started, I propose a Group Buy of Shear-Loc Instant Thumb Screw Knobs. Until the end of September, Harbor Tools is selling 100 packs at the same price as 1000 pacs, eg, \$8 to \$14.70/100 for the Knurled Knobs, \$23.10 to \$24 for the Rosette Knobs, \$9.50 to \$13.70 for the "T" Knobs, and \$9.50 to \$12.60 for the "L" Knobs. Colors are Black, Red and Gray. I will bring the ad and some samples to the meeting.

Be thinking about what \*you'd\* like to be buying, and bring specifics to the meeting.

### The Meeting, August 1, 1996

Ron called the meeting to order downstairs in the amphitheater behind the boiler. He started out by urging us all to take part in the upcoming Steam Expo at the museum. (October 5 and 6) The museum needs to draw visitors to be successful, and we need to show them that we are a useful part of their overall program. It'll help the museum to grow, and will help the position of NEMES with the museum as well. By the time this is printed it'll be over, but the big Kinzer show is coming up in mid August. The Mystic Seaport is having their annual marine engine show the same weekend, and Ron and Roland will have a steamboat there.

Errol Groff mentioned that he had gone to the Radio Controlled Sub Regatta. They had two courses, one for subs under 72" and one for subs over 72".

Show and tell started off with Herb Cotterly's model of a 17 ft Century Barrel Back from Lake Winapasuakee. Herb is from Melrose and retired from RCA after thirty two years, five of them spent working on the project to put a man on the Moon. Herb's boat is 52 inches long and weighs about thirty-five pounds. The project took him about a year and a half to complete. He got started on it when Ron Ariel (sp?) of Visual Inspection Products asked him to help set up to produce a kit for a scale model of the original boat. Herb's is the prototype, and so far 71 kits have been produced, with sales all over the world.

The parts are laser cut, which produces clean, accurate, easy to separate parts every time. Die cutting is nice at first, but as the dies wear the quality of the parts goes downhill fast. The laser cutting is done on a machine that costs about a quarter of a million dollars and costs \$150 an hour to run. The parts for each kit take 45 minutes on the machine.

With the kit you get a how to book. To assemble the frame you start with a flat panel and snap all the parts together so that they are in place and lined up correctly. Then you use CYA glue to fasten it all together. Once the frame is together you double plank it. It's 1/16" mahogany over 1/8" balsa. He used white drafting tape to simulate the white putty in the joints of the original. The deck structure is separate from the hull and comes off in one piece, exposing the interior. The

deck has foam on the bottom, which acts as floatation in case the boat is swamped. When I first saw it with the deck off I noticed the neat job Herb had done with the ribs. Each one was nicely painted black on the face, which I thought looked really nice in contrast to the natural wood sides of the ribs and planking. Later he pointed out that he hadn't painted them, the dark color was a result of the laser burning them out of the sheet. It produces a 5 mil kerf as it goes, and gives you a nice color accent as well. The kit for the wooden part of the boat is \$395. Herb's working on another kit now. It's of a slightly older boat and should take another year to reach the market.

The kit is designed for a 30cc engine derived from a weed whacker, but Herb went for a more exotic powerplant. He has a Connelly V-8 from Gary Connelly in Glenn Ellen Illinois. The engine is designed for a Cobra car model and comes either ready to run or in an assemble it yourself kit. Herb got the kit version of the 50cc engine and says it takes about three weeks to put all the parts together. It's not available as a castings kit. The engine kit was about \$2600. There's a new one coming out with all needle bearings that will cost \$3295. The water pump supplied with the engine kit is a Dubro fuel pump. Herb didn't think a little plastic pump was appropriate, so he made his own.

The overall engine installation was quite impressive. Not only was it a V-8, but it has an electric starter and a separate glow driver for each cylinder. The engine turns 12500 RPM, 14500 with a supercharger. The engine has plenty of power for the hull, and Herb says he has the throttle set at only 1/4 open to keep the power done to a reasonable level. The engine is water cooled, but only in the block, so in the confines of the boat the engine begins to get hot after about nine minutes of running. It's designed to go into a car where there is airflow around the engine as the car moves, while in the boat it's totally enclosed. He's got the carburetor on a big insulating block to form a "Heat Dam" between it and the engine to help prevent vapor lock. The prop drive is at engine speed, but he has a clutch so that you can start the engine up and have it sit at the dock before it gets under way. It has a 5/8 bore and 2 rings per piston.

There was quite a bit of discussion about fuel for it. He runs 15% nitromethane in a basically Methanol fuel. It was brought up that glow engines are semi diesels and that the % of nitro affects the timing of the engine as the amount of compression to start the burning will vary with the nitro content. In model airplane engines you add shims under the head to adjust the compression to match the fuel for maximum output. Connelly recommends 15% for the engine, so the conclusion was that they based that recommendation on the compression ratio and it probably wouldn't pay to experiment with it for this application.

Herb was pretty much done with his show and tell when Kay Fisher spoke up for all of us and asked him to start it up so we could hear it run. It didn't take too much encouragement to get him to do it. He got it ready, then stood back with the

radio control box and pushed a button. The engine gave a cough as the starter turned it over and roared to life. It had a nice multicylinder sound, and the prop under the boat blurred and disappeared. A few seconds later he shut it down with the radio, and we were all reminded that the lubrication comes from oil in the fuel. The exhaust blew oil out the transom into the folks sitting about five feet behind the stern, and then we all got that nice castor oil smell that goes with running glow engines.

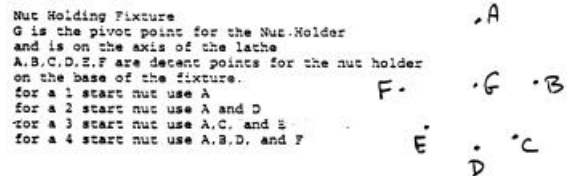
Errol Groff was next. First he passed around the swaging tool that he fixed for the local fire department to put fittings on the end of fire hose. It expands an internal ferrule to lock the fitting onto the hose. (He teaches Machine Tool at a Votech High School in Connecticut, which is why the fire department came to him.) After he started the tool around, he held up some pieces of 1" Brass rod and explained how being a Votech School they get all sorts of things show up surplus, and at one point a lot of this brass rod had appeared and he just HAD to make something out of it. They were talking about threads at that point, so he figured that was the perfect use for it-thread samples.

He started out with a single start thread. The pitch and the lead on it are the same, .083", which gives 12 threads to the inch. With 12 threads to the inch on a 1" OD brass rod, Errol had a really nice sample to pass around. Next was a double start thread. This one had the same pitch as the single start, but since it was a double start thread the lead (distance that a single thread travels along the rod in one revolution) was twice as much at .166". To make the double start thread you cut one thread to the same depth as for a single start thread, but you set the lathe as if you were only cutting half the number of threads (in this case, set the lathe to cut 6 threads per inch.) After the first start's thread is completed, index the spindle 180 degrees and cut the second start the same way you cut the first start. For a three start thread you set the lathe to cut 1/3 the number of threads that you want (in this case, 4) and then cut the first thread. If you have a cam-lock spindle with three cams, the three start thread is easier than the two start since all you need to do to index is to cut one thread in each of the three possible alignments of the chuck or faceplate with the spindle. It's cut, index 120 degrees, cut, index 120 degrees, and cut. For a four start thread the lathe needs to be set to 1/4 the number of threads that you need, so for 12 threads to the inch you need to set the lathe to cut 3 threads per inch. The four start thread has a lead of .333 inches, while the pitch is still the same as the single start case, .083 inches. To show the utility of multiple start threads there was a fifth sample, a piece of the same brass rod with a single start thread with a lead of .333 inches. There wasn't a whole lot of metal left. For the two and four start threads Errol used the slots in a standard four slot faceplate, moving the drive dog between starts to position things correctly.

When he was done showing the five sample threads there was a lot of discussion about the whole issue of cutting multiple start threads. Henry Szotek told how to cheat and avoid

the whole issue of indexing to handle the multiple starts. Use a formed tool like a geometric thread chaser to cut the threads and set the lathe to the proper lead and cut all your starts at once, side by side. Howard Gorin brought up that at some point you reach the point where it makes more sense to drive the leadscrew than the spindle because it's rotating faster. Don Strang said that yes that's true but you have to be careful because the gears aren't usually set up to be able to transmit the power from the lead screw back to the spindle so you run the risk of stripping the teeth off them.

When the discussion died down Errol brought out the nuts that fit the various threads and said that a thread isn't much good without a nut, so he figured they'd have to make some. In order to do it he needed a fixture, so he assigned it to one of his better students, a high school junior who spent about two weeks working on it. The student made the 1, 2, and 3 start nuts before he ran out of steam, so Errol only had to make the four start. The nuts are brass, so they lucked out and were able to cut all the threads on each nut without having to resharpen the bit so they were able to fit the nuts to their threads knowing that the position of the tool was the same for all of the starts. If the tool had needed to be taken out and sharpened in the middle it would have complicated getting the internal threads the correct size.



At this point Roland Gaucher handed Errol a fixture to show, since it fit right in. It was to make the threaded rod to activate the reversing gear on a small steam engine he had made. As originally set up it took 27 turns of the crank to reverse the engine, using a 5/16-18 thread. Roly thought this was too much, so he decided to go with a triple start thread on the rod, so now it only takes 9 turns to reverse the engine. The fixture holds the part in a collet and has a 12 hole indexing circle with a lock to hold the collet in any of the 12 positions. To make the nut to go with the rod Roly made a 5/16-18 triple start tap and cut the nut.

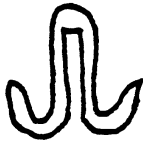
Don Strang mentioned that the Hendy lathe has marks on the spindle that allow you to easily index it. Then Errol showed us one last way to cut multiple start threads. Use trigonometry to back the tool out, move it over, and move it back in, allowing for the play in your cross slide and such of course. It's possible, but I don't think very many of us would want to do it that way too often.

Dick Boucher brought in two models. The first was a very nice belt driven drill press he had made, about 4 inches tall. He spent about 40 hours machining it from a PM research kit his son Michael had given him. The kit is \$61.50, but he says it doesn't work out to all that much an hour for all the fun he had doing it. He also had the shaper kit with him, unstarted.

It looked like it would also be a lot of fun to make and should produce a nice working shaper when he's done, although I'm not sure what you'd make using a .75 inch stroke shaper. The shaper kit is in the 70-80 dollar range.

Everett Chapman is retired from Raytheon, and brought his models in a briefcase. First he had a single action oscillating cylinder steam engine from the Graham Ad in HSM. It was TINY, about thumb sized. The kit comes with a booklet with all the drawings and info to build it for twenty some dollars. He also had a very nice looking brass whistle that brought out the remark that now he needed to build a steam boat to put under it so he could use it. The bell was made from brass handrail stock, and the base was a brass pipe reducer. He says it sounds pretty good on 30-40 psi air.

Henry Szostek had a question for the group. He has a nice little bronze casting marked "Klein Hardware" that he would like to get identified.



Let us know if you know what it is.

Kay Fisher showed a picture of a nifty little sundial watch that the Franklin Mint is selling. Does anyone know how to make one?

Don Strang At the July meeting Don had the retractable tool holder he had built to George Thomas's design and said he could make the drawings available if anyone else wanted to make one. I now have them, and will be able to get you a copy if you need one until NEMES gets a volunteer to handle the library, at which point I'll pass them along to the librarian. He recommended College Engineering Supply in England as a good source of supply for castings. Don has built their 6" rotary table and also has their faceplate V block.

In connection with the discussion in July about making fire hose fittings with 7 1/2 threads to the inch Don mentioned that the Monarch EE series of lathes will cut the 7 1/2 thread.

He had two books with him that he recommended. "Engineering Reminiscences" by Charles T Porter, which he read originally in the original serial in American Machinist, now available from Lindsey. I have this one and will second Don's recommendation. Porter was a brilliant engineer who tells his story very well. If he'd been half as good a businessman as he was author or engineer his name would probably be a household word today. He was well respected by his peers and helped to found the ASME. The second book Don found in Hay on Wye in England, which he describes as an entire town that's virtually a bookstore. This one was by Francis Jehl who was hired as a young man to work with Edison. When Menlo Park was moved in one piece to Detroit he's the man hired to run it.

For marking on steel Don recommends Copper Sulphate solution.

Swab it on with a rag and it'll put a microscopically

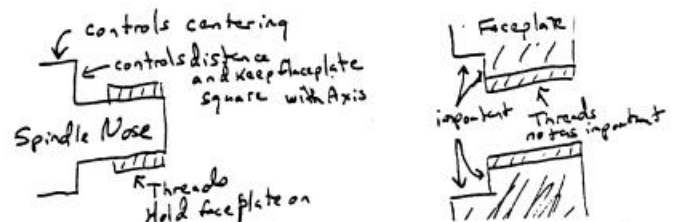
thin plating of copper on your steel that is just right for scribing.

Don also gave me a big list of "Some Dealers in Second-Hand Machine Tools & Tooling and Misc. Services" compiled by Robert M Vogel in Washington DC. I'll be getting these places into the resources section as time and space permit. He also gave me a sheet with some of his personal favorites, which will also be in the resources section. They include Bellmetric for metric bits and pieces and Rumford Industrial Supply which he describes as "Better than

After the break we got back together upstairs, with the chairs pointed away from the boiler so hopefully everyone could hear better. Once we'd all drifted up and gotten settled, Ron introduced Roland Gaucher, the main speaker for the evening. The subject was face plate work on the lathe. As usual, Roly's presentation was simple, elegant, and highly educational.

To start with he showed us a gauge he had made that duplicates the spindle nose of his lathe, which has a 1 3/4 by 8 thread on it. He used the three wire method to measure the threads on the spindle to be sure that the gauge he made is a good match for the spindle on the lathe. He recommends that you use a known piece of a free machining steel like leadloy for the gauge, not some unknown piece of something sort of the right size out of the scrap box. It's important that the gauge be accurate and have a nice finish, and that's tough to do if you've got a piece of steel that's tearing and generally not cooperating. Once you have the gauge made you can start making faceplates and other fixtures and tools to mount on your lathes spindle.

The threads on the gauge are important, because you needs the threads on your faceplates to be a good fit on the spindle threads because that's what holds the faceplate on. It's not what controls the position of the faceplate though. Position is controlled by the face and the shoulder behind the thread. So, besides making the thread on the gauge accurate, you have to make the face and shoulder behind the threads accurate as well. The reason that it is so important not to bang up the face and shoulder on the spindle behind the threads is that they are what locates the faceplate on the spindle when you mount it. The face controls how far the faceplate screws on. If there are dings on the face then the matching surface on the faceplate won't contact the face evenly. The result will be that it will cock on the threads, won't run true, and will be tough to get back off. Dings on the shoulder will have a similar affect. So, be sure to keep everything free of burrs and dings if you want first class results and want to be able to get the faceplate off of the spindle when you're done.



One of the big benefits of having the gauge for your spindle nose is that when you run across a cheap faceplate or chuck at a flea-market that you'd like to have, you don't have to leave it because it's got the wrong thread on it. (Don't worry, it WILL have the wrong thread.) If it's bigger than yours you can bush it, if it's smaller, just cut the right thread in it.

With experience you can mount a part concentric in a four jaw chuck in about a minute. At least in the two axes that match the jaws. It's a lot tougher to get the third axis lined up so that the axis of the part is on the axis of the lathe and the part doesn't wobble more and more as you move away from the spindle nose. With experience and an indicator mounted on the lathe carriage it's possible to do it. With a face plate that difficult third axis is guaranteed to be right, put the squared off back end of the part on the faceplate and it's lined up right so you only have the other two axis to worry about.

With the part to go on the faceplate, if you try to mount it, center it, and balance it on the spindle nose you won't do very many jobs on your faceplates. Roly handled this problem with a very neat little gadget. It starts with the bearing out of the water pump from a car - any car since they all seem to be pretty much the same. Clean it up and take the seals out of it. With the seals out it'll turn a lot more freely and that will help with the use of the fixture. Now make another spindle nose clone to match your lathe, this time with a concentric hole bored in it so that it's a light press fit onto one end of the water pump bearing's center shaft. Mount the housing of the bearing in one end of a steel "T" section (or use two angle irons.) Put the duplicate spindle nose on the shaft of the bearing, and you've completed

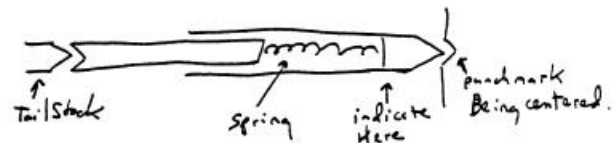
Face Plate Tamer.

Put the faceplate you want to use onto the nose, and clamp the "T" into a vice so that the surface of the faceplate is level. Put a piece of newspaper on the faceplate, then the work. The newspaper between the two smooth pieces of metal adds friction and will help the work stay where you want it. Put heavy cardboard between the clamps and the work. It adds friction to keep things in one place, and keeps the clamps from marking up the work. Now use your indicator as you rotate the faceplate in Roland's Tamer and true it up. Clamp everything up tight and be sure it's still true.

When all is running true, loosen up the vice and shift the Tamer so that the faceplate is vertical, and statically balance it before you put it on the lathe. Roly has a nice rack with an assortment of studs, t-nuts, washers, etc. to use when balancing. With a little care he can get the static balance of the off center part on the faceplate to within one 5/16 inch washer. That means that adding the washer makes that side heavy so it moves to the bottom, and taking it off makes it light so it tends to go to the top when he holds it to the side and lets go. After he gets the balance to that point he can spin it at 1700 RPM on his lathe without a hint of vibration and get a good finish on it.

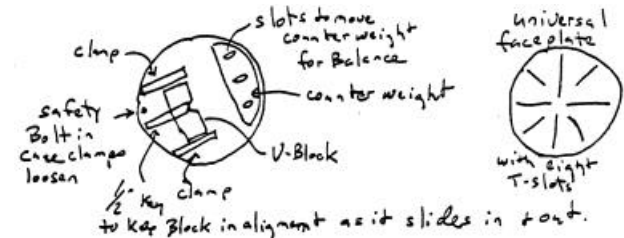
If you need to bore a hole through the part, mount it on parallels and give the boring bar clearance when you bore the hole. (Bore the part, not your faceplate!)

When you need to center up a punch mark to bore a hole, here's a good trick to use. Roland is making parts for a machine to use lasers to measure your eye and it gets the parts right on the money so the machine can scan your eye and tell exactly what the problems with it are.



A universal faceplate has 8 T slots in it. I think that this is the one he made out of an old gear. He milled the T slots in two stages, first as plain slots and then he did the undercutting with the T slot cutter. He put his mist coolant right behind the cutter and was able to cut them all with no problems because he was able to keep things cool.

The next item is a faceplate with a V block keyed to it (the key let's you slide it in and out from the axis easily while keeping it all lined up nicely.) It's for making eccentrics with both axis parallel to each other so the eccentric strap doesn't wobble as it runs. It's easy to get the throw of the eccentric right with a four jaw chuck, but it's tough to get the axis really parallel. The V block is reversible so that you can turn it the other way and use it for a right angle plate on the faceplate as well as for a V block. This is pretty specialized, it's almost a fixture rather than a general purpose tool.



How about a faceplate for making things concentric? For this he has a faceplate where he plugged the center hole, faced it, then bored it out carefully to 1/2 inch. You can then use this 1/2" hole to hold a 1/2" pin that you can reference off of. Use it to align a jig with a series of concentric steps in it that can line up the parts you are working on in turn, keeping things concentric. You can also use the pin and Jo blocks to place a part at a precise distance from the center to get the exact radius you want turned on a part.

Be careful with a faceplate, don't get hit by any of the things sticking off of it, and make sure you don't run the saddle of your lathe into the clamps.

Roly gave his whole talk, complete with lots of heavy pieces of steel and a big vice, from a flimsy table that looked like it was about to give up any minute. That brought up the subject of workbenches. Roly's is 22 feet long, made up of two 15 inch wide sections made from 2x4s glued up and then planed, to give him a really solid top on his bench, which is attached to the wall of the shop for extra stability.

The centerline of your lathe should be even with the bottom of your elbows if you want to be able to use it comfortably for long periods of time without putting a kink in your back.

### Letters to the Editor

High their:

This piece of doggerel was published in "The Engineer", early in 1964. Its origin was unknown, but it was assumed to have originated in the U.S. -- note the expletive "darned" (which is an "Americanism") in line 13. I got it from a letter to "Model Engineer".

The designer bent across his board,  
Wonderful things in his mind were stored.  
And he said to himself as he rubbed his bean,  
"How can I make this hard to machine?  
If this part here were only straight,

I'm sure the thing would work first-rate,  
But 'twould be so slick to machine and bore  
It could never make the machinist sore.

I think I'll put a right-angle there,  
And watch those babies tear their hair.  
And I'll put the holes that hold the cap  
Way down here where they're hard to tap.  
With this darned coupling I've sure had luck  
For it can't be held in a shoe or chuck.  
It can't be drilled and it can't be ground,  
In fact the design is exceedingly sound;  
He looked again and cried: `At last!  
Success is mine. It can't be cast!' "

Rotsa ruck.

Max ben-Aaron

*Thanks for the poem Max, I got a kick out of it. How about the rest of you out there, dust off your favorite bit of model engineering verse or a handy tip or anything else appropriate and send it in. (We might even consider things that are inappropriate if they're not TOO inappropriate.) scl*

# The NEMES Gazette

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