

The NEMES Gazette

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*The Newsletter of the New England Model Engineering Society,
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Our Next Meeting is at 7:00 PM March 5, 1998 at the Museum, 154 Moody Street, Waltham Ma.

Annual dues is \$20.00 - Please make checks payable to "NEMES" and send to the NEMES Treasurer: Kay R. Fisher 80 Fryeville Road Orange, MA 01364

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From the Editor's Desk:

This month has been a busy one for NEMES.

First was the Bus Trip to Cabin Fever Expo in Leesport Pennsylvania. I think this is going to be a "must" for me next year. Lots to see, enough vendors with interesting stuff to strain the wallet if you don't keep a tight rein on yourself, and the bus ride is nowhere near as long as the one to Detroit. Where I really appreciated that was coming back home after the show - no long overnight ride to tired to talk but unable to quite get to sleep.

The February meeting almost got knocked out by the weather, but about half the normal number of folks managed to show up and have a good time.

The month concluded with the second annual NEMES Model Engineering Show. It was a big success and I was amazed at how much we had managed to get into the room. I'm also amazed that we managed to get Howard Gorin's locomotive in at all, but practice makes perfect and we got it out with less problems than we got it in.

It's been suggested to me that the Gazette could sometimes use a little more white space. So, since I'm always looking for ways to make the Gazette better in the future I'll plan on expanding things to get them to come out to the right number of pages rather than squeezing things down to fit. Hopefully that will make it a little easier to read. I'm still going to work to keep it to a maximum of 10 pages though because 5 sheets of paper is under an ounce but 6 sheets would go over and postage would be 55 cents rather

than 32. I can fight my Yankee tendencies to thrift, but there's a limit.

Thanks to Harry W. Wade and Cyril Collins who have provided material for this issue. Remember that a monthly newsletter is always in need of material, so please send me something to use here.

See you next Thursday night, scl.

President's Corner by Ron Ginger

I have a lot I want to write about this month, so I'll start at the most recent and work back.

NEMES SHOW

I am writing this on Sunday morning, the day after our show. I am still on a high! It was a wonderful day, filled with lots of talk with friends and sights of some amazing work. I'm sure Steve will have his usually fine reporting of all the exhibits, but a couple impressions stand out for me. The size range was awesome, from George Luhrs tiny- 1/8" bore 4 cycle gas engine, to Howard Gorin's massive 7 1/4" gauge locomotive. The history spanned from a model of Trevithick's first steam rail engine, to some high tech tools and Digital Read outs. Complexity ranged from some very simple demonstration models of mechanisms to Rolands Bentley BR2 and some beautiful gauge 1 locomotives.

It was a great show, and I hope everyone else enjoyed it as much as I did. It was also a great success for the museum, drawing in several hundred visitors. I can't wait for next year!

I am very pleased at the cooperation and ease with which we manage this show- from the early guys that show up to help set up the tables to the last guys carrying out the trash, it all runs smoothly and without fuss. And our 'ladies auxiliary' again did a great job keeping us full of coffee, soda and goodies, and by the way, collected enough money for the table rental, so the club treasury just about broke even on the show.

Thanks to everyone for a great day.

FEBRUARY MEETING.

El-nino almost got us on this one, with a day of steady freezing rain, but about 40 diehards made it anyway, and we had a fine meeting. Our planned speaker, George King, from Mystic Seaport did not make it, but has re-scheduled for April. Ed Mann was there as planned, and his 'short subject' turned into a

very fine session of silversmithing. Ed has done some truly fine work, and it was a delight to see his examples of real metal-art.

CABIN FEVER

20 of us made the trip to the Cabin Fever Expo in Reading PA . The morning we left there was a very slight rain, but it stopped early, and the weather turned out brilliant and clear for the entire weekend. Although our bus was not quite as plush as the one we rode last year to Detroit, it was fine, and filled with 20 guys that wanted to talk mechanics, we had an enjoyable ride.

Cabin Fever is clearly established now as a 'not to be missed' event. Next year I will be really hustling everyone to try to make that show- hey maybe 2 bus loads? There were about 30 vendors there, with metal, castings, books and lots of new and used tools. One of the NAMES committee members was there counting, and found over 400 engines- about half the size of NAMES, and only the second year for this show.

NAMES

It looks like we are not going to be able to make a bus trip to NAMES- so far I have only about 10 guys signed up, and we would need well over 20 to make the bus fare reasonable. I won't give it up entirely until the March meeting, so there is still time to make it

MORE CLUB ACTIVITIES.

On the bus ride back from Cabin Fever, some of us got around to talking about other things the club could do. There was talk about a club shop, and we wondered if the museum might allow use of its shop on some controlled basis. I have discussed this with Karen and it is possible, although a number of details need to be worked out. Is there interest in having access to a shop? I know some of our members live in apartments and might not have access to larger machines. Let me know of the interest and we can pursue this.

There was also a discussion, and extended on the E-mail list, about some kind of small group workshop sessions. The first topic of interest was in silver soldering and specifically model boiler making. The general idea is for a small group to meet, maybe on a Saturday, to learn and practice some silver soldering. To make this happen we would need someone to organize it, and someone to lead a session. Another topic suggested was the use of CAD programs.

I am willing to help with these kinds of activities, but I am not ready to take on the full job- if anyone is willing to do this, let me know and we will push it ahead. As well as any other ideas for club activities.

Another suggestion was a bus trip to Sobel Machinery in NJ. This would be a one day trip, leaving about 7AM, about a 4 hour ride, and then about 3 hours

'shopping' in his amazing stock of used tools and machines- Anyone interested?

MARCH MEETING

Our speaker for March is Roger Winiarski, Roger operates Bristol Bronze, and makes reproduction bronze fittings for sailboats by the lost wax casting method. Roger will explain how he makes rubber molds, and wax injections. He will show some examples of his work and explain the whole casting process. Want to see an 8-32 thread cast in a part? Lost wax can do it.

APRIL MEETING

We will try again to hear about the engine re-build on the steamboat SABINO by George King, hopefully the weather will cooperate and George will be able to get here.

MAY MEETING

Don Strang has arranged for his friend, Frederick C. Armbruster, M.D. to talk to us about Ornamental turning. His talk will discuss details involved in reproducing a Victorian Rose Engine Lathe. The project occupied six years and includes everything from pattern making to machining and fitting finished parts.

SEPTEMBER SHOW

Member Ed Rogers is an old car fan, and has had some discussions about us holding a model show in connection with his club's big annual car show in Topfield, in September. They would like to have a model show, and the club is willing to provide us with a tent and tables for a show. Ed will have more detail on this at the next meeting, so check your calendar for September and think about a nice, warm, outdoor show.

A final note, I have suggested in the past to help support the Charles River Museum of Industry by joining the museum. Memberships are a major source of income to museums, and that is what keeps the doors open (and us with a great meeting place). Consider joining the museum. At the next meeting pickup one of their flyers by the main door. Members can visit the museum anytime, and have access to the museum's library for research.

-- Ron

The Meeting, February 5, 1998

The meeting got going about 7:15, and some of us actually came despite the ice everywhere. The scheduled speaker, George King, had 1 1/2 inches of ice on his driveway in Connecticut about 3 PM and wisely decided to postpone his talk. He'll be here for the April meeting.

Ed Mann brought in some of his silversmithing tools and projects for what turned out to be a very informative talk. A while back he got the idea that he'd like to work with silver.

His first project was a bowl. To make a bowl you start with a disk of sheet silver and stretch the metal from the middle using a block of end grain wood and a hammer. Establish a center and make as small a mark as possible. Then use a compass to mark out concentric circles about 1/4" apart (use pencil lines, don't scribe the silver.) Raise the silver by starting at the inner circle and uniformly denting all the way around the circle. Go to the next circle out and repeat till you get to the top. After raising the silver needs to be heated up to anneal it before you work it further. Use flux or a ball point pen mark so you can tell when it's getting hot. When you heat silver that has been heated before it doesn't seem to warm up as fast, but it really does so you need to be careful not to overheat it. Make the lines again, and see what you have before you start raising it again. Since it's no longer flat a good way to mark the circles is to use the rims of machine made glass bowl tops to mark each ring. Make sure that all the rings are round before you start raising it again or the bowl won't come out round.

When you are raising the silver you need to get a solid sound when the hammer strikes the silver. If you don't then you aren't hitting it in the correct place where the silver is supported by the anvil. The circumference of the bowl will get smaller and thicker as you go along.

To finish things up you need really shiny tools so they won't mar the surface of the silver. To polish hammers and tools of hardened steel get them as good as you can with an oilstone and then go to a white buffing compound stick. I was amazed by the polish that Ed had on his tools. The one I liked the best was an old railroad track bolt. The threads and shank were all banged up and looked like they'd been through the mill, but the convex head of the bolt was as smooth and shiny as a mirror. You could look in it and see a clear but distorted image of your face looking back at you.

The bowl took him about a month to make. His second project was a cream pitcher. He took a course at the DeCordova Museum back in 1957 to get started.

A wine glass can be made from a bowl top, with a two piece base. He has made them by turning an aluminum master pattern for the stem, then making a rubber mold to cast wax patterns in for investment cast stems. Another way he's made stems is by rolling sheet into a tube. The parts are soldered together to form the final chalice.

He showed us quite a few very nice pieces that he's made, including a creamer and sugar on a tray, which he described as "a nice wedding present." Silver can be spun, but all of the work he has done has been hammered.

When silver wire is drawn down in diameter it gets harder. Ed took advantage of this to make six link chains. By drawing the wire down enough to harden it some the individual rings become strong enough that they will form a substantial chain without having to be soldered closed.

There are three common types of silver solder that melt at three different temperatures. He uses the highest melting one first when assembling a project first so that later operations don't melt what he's already done.

For a box with a hinged cover he makes two tubes of silver the same size by pulling them through a die with a pin inside to keep the inside the size he wants. Then the tubes are soldered to the two parts of the box, but not continuously - only where they will remain attached as part of the hinge. Put the seam of the tube on the inside of the solder joint were it won't be seen, and after the tubes are soldered in place use a saw to cut out the spaces in the two hinge parts. If you solder in the right places when you make the saw cuts the spaces will fall right out and the hinge will fit perfectly - just like the ones in the box Ed showed us.

The first chain was in gold, and he repeated it in Silver, making a chain long enough that it didn't need a clasp, his wife could just put it over her head. The problem was it was too heavy, so he made another one with finer gauge wire. He also made a different style of chain with soldered links of silver wire bent into a "U" shape and threaded into each other to make a nice chain that is strong despite being soft since each link is soldered.

For finishing the silver when the final shape of the piece has been attained he uses a tam-o-shanter hone from Scotland. This is a mined stone usually seen in small pieces the size of a pencil, although Ed says he's got a piece at home the size of a brick.

The Second Annual NEMES Show

The show was a big success, like Ron said my only real complaint is that it was over too soon. After we got Howard's Locomotive in place I barely had time to go around the room once before it was time to start packing the Four Aces up to get it back home. Practice makes perfect though, I think we got it home with less effort than it took to get it there.

First things first, so a big THANK YOU to the Ladies Auxiliary for handling the refreshments again in superb style. Not only did they provide fuel to keep us going all day, but they took in enough money so the club about broke even on the show - pretty good considering we didn't charge anything for display space. So once again thanks to Bea Boucher, Gail (hopefully this time I spelled it right) Martha, and Pat Fisher for a job well done.

WINNERS

Thanks to some work by Steve Cushman, we had several raffle prizes for the exhibitors at our show. Following are the prizes and their winners.

Family Membership to the Charles River Museum were won by Paul Gauffin and Tom Ritchie

A subscription to MODELTEC magazine was won by Paul Budlong

A subscription to PROJECTS IN METAL was won by Harold Holland

A Subscription to HOME SHOP MACHINIST was won by Joe Warfel

New England Brass and Tools gave us 2 great prizes, a keyless chuck which was won by Mark Marini, and a bench grinder won by Roland Evans.

The Grand Prize, a \$300 gift certificate to Brothers Machinery was won by Herb Cotterly.

We are very grateful to the suppliers for donating these prizes. If you do business with them, add your thanks for their support of our club.

Thankyou from NEMES to our generous supporters, Modeltec Magazine, Village Press Inc., New England Brass and Tool, and Brothers Machinery, and especially the Charles River Museum who not only donated a raffle prize, but who provides us with our monthly meeting space.

There isn't time or space to put in everything in the show, but I'm going to put in some numbers to try to give an idea of the show. There were fifty exhibitors, and LOT'S of visitors. Thirty two IC engines, and thirty four Stationary and Marine steam engines - not counting the one in the beautiful RC steam launch. Twelve steam locomotives made it to the show, from O gauge live steamers that could be easily picked up to examine the details to a 4-8-4 7 1/4 gauge locomotive that could barely be maneuvered into the hall. A four hundred pound B&M switcher with an 11HP engine and 3 speed transmission got wrestled into the hall as well. Nine Stirling and Hot air engines made it, which doesn't count several wooden models showing a variety of hot air engine configurations. Four Traction engines were present, three Minnies and one from Rudy Kouhought's plans published in the early 70's. Two Bill Harris Steamrollers, a miniature cannon, a flamelicker engine, a Congreve Clock, a couple of hand pumps, some solar powered magnetically levitated motors, some miniature firearms, a Kozo pressure gauge, and of course Roland's BR-2 covers most of the models there. Next comes the machines and the tooling. Ron brought his NC converted Sherline mill, there was a quorn, a taper attachment, a gear hobber, a couple of ball turning attachments, a face plate made from a 1-1/2 - 8 Nut and a barbell weight, a machine to readily sharpen 4 facet drills up to 1/2" in diameter, a Maple machinist's

tool box, a toolpost grinder, a dividing head, several different lathe toolposts/toolholders, the EDM machine from the Projects Five book, a very nicely done rotary phase convertor that will hopefully appear in a future issue of the Gazette, and last but not least a slick machine for pulling up a well casing using 3 wheelbarrow wheels set at 120 degrees and a bunch of gearing on an electric motor. (I'm not going to claim to have everything - there was just too much great stuff there to possibly mention it all.)

Lathe-aholics Anonymous

the following comes to us from Harry W. Wade, Nashville, Tennessee, founding member Mid-South Live Steamers. (Copyrighted 1998 by Harry W. Wade, Used with permission.)

Hi. My name is Harry. I'm a recovering lathe-aholic. My first lathe experience was an Atlas 10 x 36, and I liked it a lot, but I was young and fell in with a bad lot who were only "experimenting" and we felt like we could walk off and leave it any time I wanted to. But one thing led to another and soon I wanted a bigger thrill. The Atlas didn't give me the kick that I craved, so I tried a Burke #4 mill. That was OK but it just didn't have the effect I needed and wore off too soon. I tried a Jet mill because I had been told the Asians were bringing in some really cheap but potent stuff. The thrill was not enough. It was lathes that were the real high and I couldn't resist anything that came along. Next there was the Harrison M250; ecstasy, I was hooked. Then I was introduced to speed. First there was a Cowells ME90, and a Cowells 90W. Then someone turned me on to some really fine Boley and I had to have a hit. Then one of my old friends came around with an Atlas 6 and it reminded me of when life was simpler and I couldn't resist. I had hit rock bottom. Now, little by little, I am trying to regain control of my habit and of my life and minimize my reliance upon a machine fix to get me through the day. It's a daily struggle but it's one step at a time. One day I may have it under control, but I will never be cured.

D-Bits and Drill Bushings

Cyril Collins

Some 58 years ago I was a toolroom apprentice in England and as was usual served some of my time on the lathe. The batch production method was followed because modifications and amendments were frequent. Most of the components in the aircraft industry were of modest dimensions and almost always involved drilled holes of some sort. The drilling was done by semi-skilled labour using MS drill jigs. In production, the twist drills were guided by hardened drill bushings, the holes for these bushings being precision bored on a SIP jig borer.

The bushes themselves were turned from silver
(continued on page 7)

steel, (drill rod), and were ground on the OD. The larger sizes had the bore ground too, but of course, their smaller brethren were too little for the grinding wheel. The procedure was, after hardening and tempering, to grind, (or in the case of the smaller sizes, to lap), the bore first then grind the OD to size. This is where the D-bits came in.

These smaller bushes called for a bore in the number drill range and the toolmaker grumbled if he had to lap more than .001" from the bore diameter. Our method was to carefully drill the hole in the bush with a drill, ideally, .008"/.010" undersize, then to make a D-bit and slowly ream out the hole with a copious flow of coolant, acting as a lubricant.

The turner, (lathe operator), made his own D-bits as follows. Using a piece of silver steel he would turn and then polish the cutting diameter to the exact size of the desired hole in the drill bush. Then he would turn a shank some .015" dia. less than that, so as to permit the application of the coolant, finally cutting it

off further along the bar. Thus there were 3 diameters concerned, the actual cutting diameter, the reduced shank and a length of untouched bar for holding in the drill chuck. The next step was to harden it, a med. bright cherry red and, after polishing, to temper to a light straw. Back to the lathe and the blank was polished until it was .001" below the finished bush size. To the tool grinder then and carefully, taking care not to draw the temper, grind away half of the cutting part to form the "D" cross section. This grinding was done on the periphery of the wheel so that the resulting "flat" was not actually flat, but slightly concave. The dimension of the finished tool was determined by a mic. from the "flat" to the untouched side of the cutting dia. and was .001" greater than half of that diameter. Anything less than that resulted in a bit which cut undersize. The front was backed off so that it cut on one side only and a slight chamfer added.

These bits always worked well and to aid future identification, had the size each one produced, electric etched on the flat area. I ended up with about 40 of the D-bits in a stand rather like a number drill stand. Of course, we also had to make the brass laps needed by the toolmaker, but these were straightforward. So yes, D-bits are ideal for producing highly polished and accurately sized holes and can also be made and used for tapered holes.

The lap used by the toolmakers was quite a simple affair. A piece of half-hard brass was turned identical to the dimensions of the associated D-bit. The actual lapping diameter, of course, had to be no greater than the cutting dia. of the D-bit, otherwise it would not enter the hole at the start of the lapping operation. If it were a thou. or so smaller it was of no consequence.

When he got it, the toolmaker proceeded to hacksaw a longitudinal slot in the working diameter of the lap. Holding the shank of the lap in the chuck of a drill press, and running at about 1000rpm, he coated the lap with some coarse Carborundum paste, and commenced lapping. With the bush held in his hand he ran it up and down the lap, which was removing minute amounts of metal. It was imperative that he use the whole length of the lap, moving up and down all the time, otherwise he got a hole which was not parallel.

When he felt the lap was not cutting as he wished, he stopped the chuck and with a screwdriver inserted in the end of the slot he had cut previously, gave it a little twist thus enlarging the effective diameter of the lap. The enlarged-dia. lap was sometimes a little too big for the hole but the saw cut permitted it to close down to the proper size, whilst exerting a radial pressure on the sides of the hole being lapped. He usually finished by cleaning off with paraffin, (kerosene?), and using a fine grade of Carborundum paste to finally attain the size he desired. The laps were considered expendable, normally not being used again, but were a great source of brass for us miniature model makers! The bushes then, BTW, went to the cylindrical grinder to have their OD's ground, being pushed on a mandrel for that purpose.

Classified Ads

FS: LOGAN model 1955 11x24 lathe, quick change gear box, cabinet model, disassembled, no tooling. Bed and bearings in good condition. \$500 or B.O.
FS: Smithy AT300 (CB1220) 12x20 lathe with mill head, with basic tooling, \$600, with 8" 4 jaw, and face plate, \$750 The Smithy is a great machine for small

space shop. You pick em up, 12 mi. west of Nashua NH For more details: Home: 603-673-5861 Work: 978-937-3700 x669 email: mac@adra.com

Calendar of Events

Thursday March 5, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Thursday April 2, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Thursday May 7, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Saturday May 9, 1998 -- Big Swap Meet at Paul Gauffin's new place in Mason New Hampshire. He's at 443 Rt 31, which is easy to find as it's right at the intersection of NH Routes 31 and 124 (it's Rt 31 in Mass also)

Thursday June 4, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Foundry Supplies

There's a new foundry supply company right here in Massachusetts that is aimed at dealing with the small scale hobby foundryman. The info comes via the internet and the west coast, but they are pretty much local so should be convenient for NEMES members looking for those hard to find specialty supplies:

P. L. Morin & Associates
Foundry Equipment & Supplies
91 Ford Street
Three Rivers, MA 01080
413-283-9365

TIPS AND TECHNIQUES

by Ed Kingsley

Peter's Laws,

or "The Creed of the Sociopathic Obsessive Compulsive"

- 1) If anything can go wrong, fix it! (To hell with Murphy!)
- 2) When given a choice - take both!
- 3) Multiple projects lead to multiple successes.
- 4) Start at the top, then work your way up.
- 5) Do it by the book, ... but be the author!
- 6) When forced to compromise, ask for more.
- 7) If you can't beat them, join them, then beat them.
- 8) If it's worth doing, it's got to be done right now.

- 9) If you can't win, change the rules.
- 10) If you can't change the rules, then ignore them.
- 11) Perfection is not optional.
- 12) When faced without a challenge, make one.
- 13) "No" simply means begin again, at one level higher.
- 14) Don't walk when you can run.
- 15) Bureaucracy is a challenge to be conquered with a righteous attitude, a tolerance for stupidity, and a bulldozer when necessary.
- 16) When in doubt, THINK!
- 17) Patience is a virtue, but persistence, to the point of success, is a blessing.
- 18) The squeaky wheel gets replaced!
- 19) The faster you move, the slower time passes, the longer you live.

My apologies to Peter, who's "Laws" he graciously allowed me to reprint here, for losing his Email and thus his last name and address. Since he asked me to mention that his "Laws" are available on a quality cotton T-shirt, at a nominal cost, I will try to recover that information and include it in a subsequent column. Peter is an HSM, and I like how his mind works

PARALLEL THOUGHTS

I mentioned earlier making a pair of vise parallels from 3/64" tool steel and using them "in tandem" with a set of 1/8" parallels that I had. It made it very easy to drill, or mill, close to the jaws of the vise when I needed to get near the edge of a workpiece. I had the opportunity, recently, to use a set of Brown & Sharp, 1/32" thick precision parallels and noticed something about them that I had not experienced with my home made, slightly thicker, set.

The 1/32" parallels are SO thin that it is very easy to mount your work ON one of the pair and OFF of the other, sometimes without noticing it. I was doing some repetitive work and found that I needed to first clamp each piece - above the parallels - then gently release the vise pressure and let the work slide down onto the parallels. After that, I had no further problems. The 20 pair, B&S sets go for \$105 at MSC, but I've seen Phase II and non-branded import sets selling for almost half that, or so. If you have the need, they are definitely helpful, and a lovely shade of blue.

PIN MONEY WELL SPENT

About 9 months ago, shortly after ENCO was bought by MSC, the former advertised a couple months of amazing sales. Amongst the many bargains offered were boxed sets of Gage Pins*, in diameters from .011" to 1". I bit and bought two sets, .061 - .250" and .251 - .500", 440 pins in all. They sat unused, for several months, until I needed to bore a .381" hole in a bar, to a very tight tolerance and remembered the pins. I took out three pins, .379", .380" and .381". I

used them to carefully gage the final passes of the cut and produced a fit that I'm sure I could not have achieved using telescoping gages with a micrometer or calipers.

* For anyone unfamiliar with Gage Pins, they are hardened and ground steel rods, about 2" long. Diameters are decimal sizes in increments of .001", and are available either "Over" or "Under" sized. "Over" is nominal size + .0002", and "Under" is nominal size - .0002". For example, a .250", (1/4") "Under" sized pin, measures .2498" and an "Over" sized pin measures .2502". Individual standard Pins, special sizes** and Metric sets are available from MSC and other suppliers. Two degrees of accuracy are commonly sold, "ZZ" (+/- .0002") and "X" (+/- .00004"). I've measured my "ZZ", "Under" sized sets and found them to be nominal size -.0003".

** There are "tenth's sets", containing a "target" size pin and 4/5 pins sized above and below the "target", by .0001"s, e.g., .2495", .2496", .2497", .2498", .2499", .2500", .2501", etc. Sounds like the way to get that engine bore "just so", (and/or maybe not paying the rent for awhile, but hey)

Since that time, I have found more and more ways of using them; to measure slots, to set depths of cut, to measure existing holes, to locate existing holes (put the pin in the chuck and move the work around until the pin slips into the hole) and to be an axle when I'm milling an arc on the end of a piece of bar stock - the fit needs to be as tight as possible here, when you're free-handing the cut!

Last week, I milled down the ways of an old (but neat) drill press vise that had seen many better days. When I finished, I realized that, although the ways were now straight, smooth and parallel, the moving jaw was sitting .030" lower than it had previously, and the lead screw would no longer fit into the hole in the back of it! After the Exedrin kicked in, I found the Gage Pin that fit the most snugly into the threaded hole the lead screw ran through, and I stuck it in there (to represent the lead screw, which had way too much play to be useful). I slid the moving jaw up to the pin and scribed the outline of the end of the pin onto the jaw.

I put the loose jaw in the milling vise, face down, found the Gage Pin that matched the existing hole in the jaw (now off center) and put it in a collet in the mill. I used the pin to find the center of the old hole and then moved the table until the pin was over the center of the outline I had scribed for the new hole location.

I swapped the pin for an end mill, wide enough to encompass the old hole, and milled a new hole. I made a Delrin bushing to fit into the new, bigger hole that accepted the end of the old lead screw, and all was back to normal.

What I'm trying to say here is, Gage Pins are wonderful tools and, like so many other discoveries I've made lately, I'm wondering how I got along without them. My only regret is that I didn't buy them all the way up to 3/4" diameter, when I had the chance. They're also great for pushing through holes you've drilled to see just how far out of perpendicular they really are, although sometimes I've noticed it's just as well not to ask.

SPEAKING OF PINS

I was wondering - could you use a 'Theoretical', to count the angels dancing on the head of a pin?

-- Ed Kingsley

The NEMES Gazette

c/o Stephen C. Lovely

Post Office Box 277

Milford, Ma. 01757-0277

newsletter of The New England Model Engineering Society