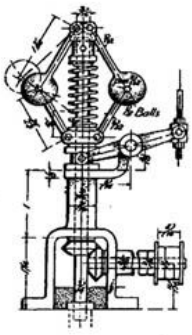

The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 193 May 2012

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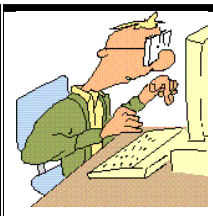


Editor's Desk

George Gallant

Changing of the Guard

As you read in last month's Gazette and have heard at the previous meetings, many of the club's officers are stepping down effective this month. As a group we have benefited greatly from their willingness to serve. Now it is your turn to respect their decisions and step up to the plate.

While I have volunteered be the Gazette editor, I would encourage anyone who aspires to position to make themselves known. My machine shops skills and industry contacts are non-existent. If you want articles relevant to mechanical engineering, be prepared to make contributions!

This issue of the Gazette is being prepared with "Open Office Writer" on a Linux system. Please notify me of any format issues.

Issue	Contribution Due
JUN	MAY 21, 2012
JUL	JUN 18, 2012
AUG	JUL 20, 2012
SEPT	AUG 24, 2012

Next Meeting

Thursday, May. 5th 2012

7:00 PM. Meetings held at:

Charles River Museum of Industry
154 Moody Street
Waltham, Massachusetts

Membership Info

New members welcome! Annual dues are $25 (mail applications and/or dues checks, made payable to "NEMES", to our Treasurer Richard Koolish, see right) Annual dues are for the calendar year and are due by December 31st of the prior year (or with application).

Missing a Gazette? Send mail or email to our publisher.

Addresses are in the left column.

Contents

President's Corner

Dick Boucher

First Before Anything Else

Many, many thanks to Frank Hills for guiding the publishing of our fine journal for these many issues and secondly as many thanks to George Gallant for stepping up and taking over the task.

Our Gazette is read all over the world thanks to the technological knowledge of Errol Groff. But without the input of our members and the assembling of the submitted articles by our editor before sending it to Errol and our long time publisher Bob Neidorff the Gazette would not go very far. So Thank you to all involved.

The Meeting

This month again one of our own members has stepped forward to bring us information on his latest project. Bruce Murray will be talking about the ¼ scale Jaguar DOHC engine he is working on. This should be another great discussion for our meeting.

Miscellaneous Ramblings

On March 31 Bea and I ventured out to the Assabet Valley Regional Technical High School to witness a Battle Bot competition first hand. First let me describe the setup in the school cafeteria area. The first thing that catches your eye is the fighting arena. It is an octagonal unit about 15 feet across on the flats standing at least that high. The floor of the cage is raised some three feet above the cafeteria floor, this to allow easy viewing for spectators and putting the radio control transmitters at a comfortable height for the competitors. The cage is constructed of aluminum Unistrut framework and is sheathed in clear polycarbonate (most likely Lexan) to contain robots when they are sent flying.

Spectator seating was on three portable bleachers giving a good view to those watching. On the other side of the cafeteria tables were set up with electrical power for a "pit" area in which the robots could be set up before the competition and repaired between bouts. More on that later.

I was rooting for the team from the Machine Technology class that I have been a substitute teacher in for the last two years. The competition is a double elimination affair and unfortunately our first competitor was a whirling dervish design with a horizontal blade that actually buzzed when it was up to speed. In the morning before the competition I had a chance to look at the device with some of the covering off. The blade was driven by a brushless motor of about 2½" diameter, delivering power to the blade weapon through a number 35 chain. Our team was holding it's own against this bot, getting in a number of good solid blows with the weapon that the students had designed, which rotated much like a grain harvester. This rotated real fast with two rows of hardened steel teeth that got some metal shrapnel flying around in the arena. Unfortunately the dervish got a good solid blow on our bot that bent the frame enough that one of the drive wheels was off the floor and the bot could no longer move so we lost the first round.

I forgot to mention that there are four judges from local industry doing the point scoring for the event. In our second round we were delivering good punishing blows and absorbing what seemed an equal amount but the judges determined that our competitor got the upper hand so we were done for the day except to watch the utter destruction of some of the machines and the Robot Rumble

The whirling dervish that got us in the first round was called Mr. "T". It got its comeuppance because it not only did damage to other "bots" it hit but it also fell victim to the old law of physics that says for every action their is an equal but opposite reaction. Every time it got in a real significant hit it went flying itself, usually into the cage wall. In the second round it finally busted both of its drive wheels off and was out of the action. It was kind of too bad that we drew the accursed thing in the first round.

One other really damaging bot had a mishap with a much simpler bot and actually caught fire in the cage. Very exciting.

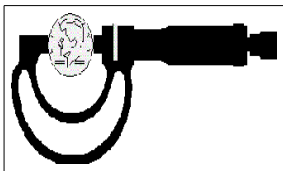
Bea and I had to leave around noon so we missed our bot's last event . It was a "last man standing" affair called a "Rumble". All the eliminated bots are placed in the cage and have at each other. Our team won that event. So congratulations to the students and instructors of the North Shore Technical High School Machine Technologies department. The instructor David Sommerville gives the students free reign in the design of the bot which they do in Solid Works and then manufacture

the machine using both CNC lathes and Mills and conventional (hand crank) machines.

There will be another competition in Plymouth MA later this year. I will post the time and date when I get it.

The other ramble was a motor trip to Kentucky to be with our 42-year-old daughter when she had her tonsils removed. All I remember from my young adventure was the cone over my nose and the ether being dripped into it. It isn't so easy when you are 42. Suzanne spent a really lousy week while her parents visited.

Dick B.



Tool Corner

By Frank Dorion

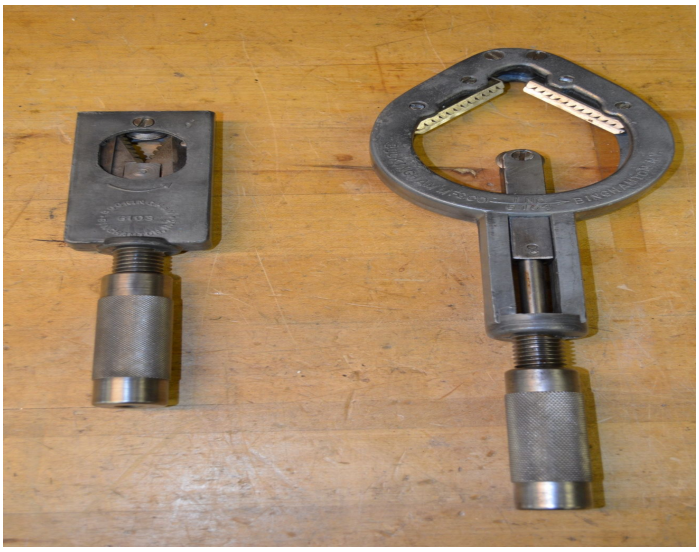
Damaged Threads

Damaged threads have probably been an issue for metal-workers since the day after threads were invented. And Murphy's Law rules when it comes to thread damage – you always seem to run into it at the worst possible time and in the worst possible place. Maybe you're thinking you can back the nut off that stud, even though the threads are damaged. So you get the wrench on it and as soon as you reach the damaged area, the nut locks up solid and it's starting to feel like you will shear the stud off if you pull any harder on the wrench. Maybe cleaning up that thread first would have been a good idea.

Thread damage problems comes in two basic types. The first is a situation where one end of the threaded component is accessible, allowing the use of a closed rethreading tool that completely encircles the thread. The nut on a threaded stud as above would be an example. The second and usually more difficult situation is where neither end of the threaded component is accessible and the thread damage is somewhere in between. Solving these problems has taxed the ingenuity of many an inventor, and quite a number of solutions have been offered. Let's take a look at a few of the more common thread repair tools.

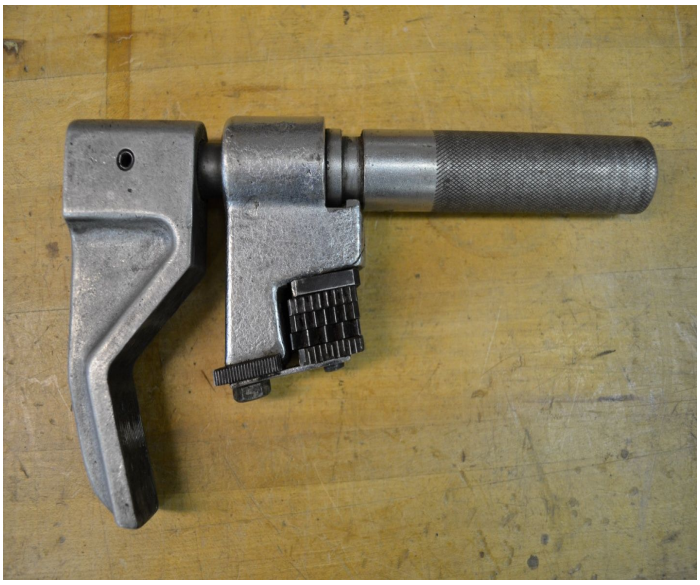
The first and most obvious tool to use, if you have access to one end of the thread, is a rethreading die. An example set by Snap-On is shown below. These dies are hex-shaped so they can be run onto the thread with a regular wrench. They usually work very well if you have the correct size of die for the job. If not, you are out of luck.

A different approach to the thread damage problem was developed by the Buckingham Mfg. Co. of Binghamton, NY. Their thread repair tools (below) are designed to clean up any 60º thread and come in two sizes that cover a range from about 5/16" to 2-½". As shown in the detail photo, the key element in the Buckingham design is a pair of 60º cutters mounted adjacent to 60º guides. The cutter and guide are each sandwiched between two bowed flat springs that allow both the cutter and guide to move laterally to adapt to the pitch of the thread being repaired. I've used both of these tools and they do a decent job, but their closed design restricts their use to situations where one end of the damaged thread is accessible.



The next type of thread repair tool is one I've been seeing in flea markets for the last 40 years. Called the Multiple Die No. 28, it is basically a set of split rethreading dies, hinged at one end so it can be applied in the middle of a run of thread. I believe this design dates back to the early days of the automobile, and, while it might get you by in a pinch, it wouldn't be my first choice for cleaning up a bad thread. Also, the tool is specific to certain thread sizes and therefore limited in application.

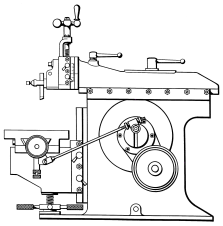
Another tool with automotive origins is the OTC multi-thread chasing tool shown below. The version I have is quite large – the minimum thread size it can handle would be about 1-1/8". Most likely, smaller sizes of this tool were also available. It's a good design with one thread chaser mounted for action and the remaining sizes stored conveniently just below. With one exception, each chaser has a different thread on each of its four edges, so this tool can handle 22 different thread pitches in all.



Similar in concept to the OTC tool are the two Nes tools shown next. The Nes tools differ in that their cutters are designed to be universal for all 60º threads. The close-up photo shows that both cutters are sharpened and active in removing thread obstructions. To accommodate different thread pitches, the cutters are mounted so as to have liberal play laterally. The smaller tool handles thread diameters from 11/16" to 1-1/2" while the larger version ranges from 1-1/4" to 5" diameter. The Nes tools are still on the market today.

Last are the Nicholson thread files. Sort of a combination file/thread chaser, these tools are square in cross-section, with the cutting areas made like a four-in-hand file so that each thread file is capable of cutting eight different thread pitches. Various versions are shown below, but I believe they are currently available in two versions for English threads and one version for metric threads. This assortment of three files covers most of the common thread pitches, and they are relatively inexpensive at about $15 each. I have used these files successfully on many occasions

Surveying the above assortment, the right tool for the job depends on the situation you are facing. If you have access to the thread from one end and you have the correct size rethreading die, then the rethreading die is the way to go as it will give you nice clean threads in one pass. If it's an oddball thread or there's no access to one end, one of the other thread chasers shown above may do the job. Remember though that you need some room to swing these tools, so they may not be an option in a tight spot. Another consideration is that, unless you make a lucky flea market find, these thread repair tools tend to be quite expensive as they are made for professionals in the trades rather than the DIY market. If I had to pick a single type of thread repair tool, the Nicholson thread files would be my first choice. They are reasonably priced, readily available, capable of cleaning up the common thread sizes in almost any situation, and they work well.



Metal Shapers

By Kay Fisher

G. Sparber's Gingery Shaper – Part 24

Machining the Downfeed Head and Protractor

The Downfeed Head

I took a few liberties wit Gingery's design for both of these parts.

The trickiest part of casting the downfeed head is to mold the pocket. I avoided this "challenge" by leaving the pad solid and machining the pocket later on my mill/drill.

Facing Downfeed - Photo by R. G. Sparber

Il wanted to remove the sprue from the mandrel first but this was not to be. You can see my saw cut above. The aluminum was securely hugging that steel mandrel. It was not a problem at this stage since I was just truing up the top of the pad. At almost the last step in machining this part, I realized I had wasted my time cutting this face. The mill/drill was needed to clean up the cut end of the cut-off mandrel so it was easy to clean up the top of the pad at that time.

After Facing - Photo by R. G. Sparber

The cleaned up surface is true enough but it sure took a long time due to the low RPMs needed for such a large effective diameter and discontinuous cut.

Removing Scrap - Photo by R. G. Sparber

In order to fit the dog on the sprue end of the mandrel, I had to cut away some of the scrap aluminum. I freehand cut the sprue metal on my bandsaw but the semicircle of aluminum held tight. I ended up prying it off with a chisel and hard swings from a large hammer.

Facing Backside - Photo by R. G. Sparber

The back side of the downfeed head was trued up next. The cast disk was off true by 0.1” so I just cut until the surface was fully machined. The disk's thickness came out 0.05” under size. Fortunately, this dimension is not critical. In hindsight, I should have made the disk about $^{1}/_{8}$” thicker to allow for casting inaccuracies.

I put this piece aside for later mill/drill work and took up the protractor casting.

The Protractor

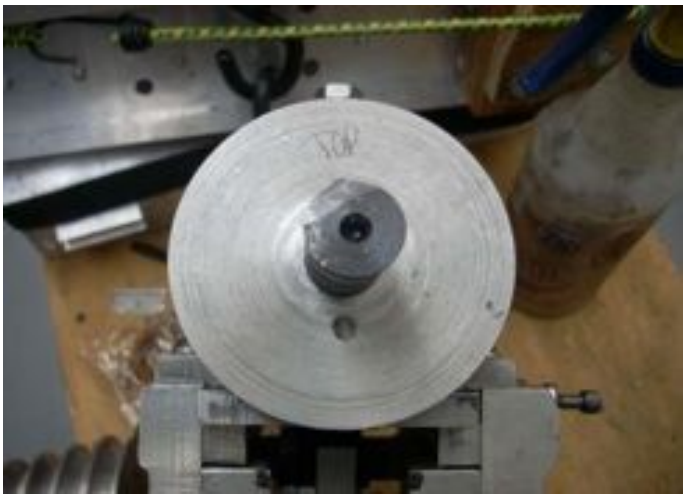
Facing Disk - Photo by R. G. Sparber

This disk was a bit crooked too, so I just faced each side until it was fully machined. In the end, the disk came out nice and true.

Gingery specifies the diameter of the disk so that a standard ruler can be used for the protractor tick marks. I chose to measure the cleaned up disk's diameter and make the ruler in my CAD program. I use DesignCad Version 14 and it turned out to be very easy to generate the artwork. I printed out both the artwork and its mirror image. I will later take it to Office Max® and have a copy made on clear plastic. The right reading artwork will be used now

to verify all fits right. The plastic copy will be flipped over to protect the lines and text. Two screws will hold it to the disk as Gingery did with the ruler.

Fitting The Protractor



Disk with Mounting Holes - Photo by R. G. Sparber

Gingery explains how to remove the mandrel from the protractor disk. Put a drop of oil on each side of the disk on the mandrel, give the mandrel tap, and out it comes. Well, not for me. I had to give it heavy whacks with my largest ball peen hammer before it finally came loose. This is not the best way to treat a part that has just been carefully machined square.

I then marked out the two mounting holes and drilled them with the clearance drill for ¼-20. You can see the bottom hole clearly but the top hole is partially hidden. To avoid any confusion, I have marked which hole is on top. I used a piece of scrap mandrel to align the protractor disk in the ram's pivot hole.

Holding the protractor firmly, I used my electric hand drill to spot through the top hole with my clearance drill.

Completing Hole - Photo by R. G. Sparber

I then used my bench block and my tap drill to complete the hole. The bench block was used a second time to guide the ¼-20 tap.

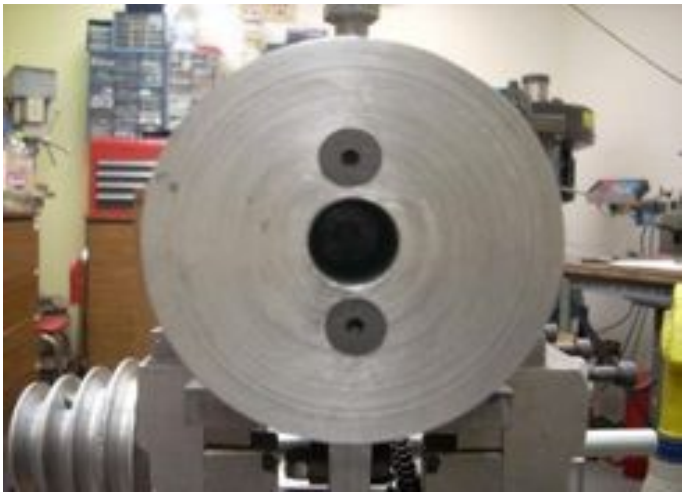
One Hole Done & Screwed - Photo by R. G. Sparber

The protractor was then taken back to my drill press for countersinking. I run the drill press up to full speed and then cut power before lowering the countersink into the hole. It takes a few passes but the results are better than trying it under power at too fast a speed.

You can see that I now have one hole completely done and the screw in place. The screw and rod guarantee that as I drill my second hole, all will be in alignment.

Clearance Drill Result - Photo by R. G. Sparber

Above, you can see the cone left by the end of the clearance drill.



2nd Hole Done - Photo by R. G. Sparber

Using the same procedure with the bench block, tap drill, tap, and countersink, the second screw is secured. Note that the disk is too large to fit between the ram ways.

If you look carefully in the above picture, you can see my Gingery drill press. I use it often.

Stay Tuned for part 25 from R. G. Sparber next month.

Keep sending me email with questions and interesting shaper stories.

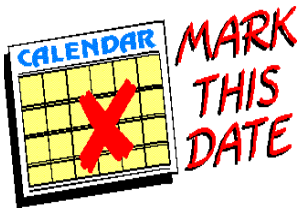
My email address is:
KayPatFisher@gmail.com

Kay

NEMES Shop Apron

Look your best in the shop! The NEMES shop apron keeps clothes clean while holding essential measuring tools in the front pockets. The custom strap design keeps weight off your neck and easily ties at the side. The apron is washable blue denim with an embroidered NEMES logo on top pocket.

Contact Rollie Gaucher 508-885-2277



Upcoming Events

Bill Brackett

Calendar of Events

To add an event, please send a brief description, time, place and a contact person to call for further information to Bill Brackett at:

thebracketts@verizon.net or 508-393-6290

May 5th - Connecticut Antique Machinery Museum Spring Power Up in Kent, Connecticut
Contact John Pawlowski President
P.O. Box 1467, New Milford, CT 06776
http://www.ctamachinery.com/SpringPowerUP2012.html

May 6th - NHPOTP Engine Show
Route 113 and Route 3 in Dunstable MA
Contact Robt Wilkie 207-748-1092

May 3rd - Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry
154 Moody St; Waltham, MA 781-893-5410
http://www.neme-s.org

May 20th - Spring Steam-up
Waushakum Live Steamers
Holliston MA
http://www.waushakumlivesteamers.org

May 20th - 9:00am The Flea at MIT
Albany Street Garage at the corner of Albany and Main Streets in Cambridge
http://www.mitflea.com

May 26-27th - Bernardston Flea Market and Gas Engine Show
Route 10 off Route 91 Bernardston, MA
Contact Vickie Ovitt 413-648-5215

May 26th: - American Precision Museum opens
http://www.americanprecision.org

June 7th - Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry
154 Moody St; Waltham, MA 781-893-5410
http://www.neme-s.org

June 24th - 11th Annual Van Brocklin Meet
Waushakum Live Steamers, Holliston MA
http://www.waushakumlivesteamers.org