



The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

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Editor's Desk

Frank Hills

Sorry folks, but my brain is melting from too much work this month, so I'm turning over this space to Victor Kozakevich who sent me a list of wacky tool definitions I've been trying to make space for. Enjoy! Take it away Victor!

Tool Definitions!

DRILL PRESS:

A tall upright machine useful for suddenly snatching flat metal bar stock out of your hands so that it smacks you in the chest and flings your beer across the room, denting the freshly-painted project which you had carefully set in the corner where nothing could get to it.

WIRE WHEEL:

Cleans paint off bolts and then throws them somewhere under the workbench with the speed of light. Also removes fingerprints and hard-earned calluses from fingers in about the time it takes you to say, "Oh, shit!"

Next Meeting

Thursday, May 6, 2010

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

Editor's Desk.....	1
NEMES Gazette Editorial Schedule	3
President's Corner.....	3
The Meeting	3
Benefits of a Gazette Article	3
Metal Shapers	4
Upcoming Events.....	7
Why No Meeting Last Month?	8



Editor's Desk

-continued from page 1

SKILL SAW:

A portable cutting tool used to make studs too short.

PLIERS:

Used to round off bolt heads. Sometimes used in the creation of blood-blisters.

BELT SANDER:

An electric sanding tool commonly used to convert minor touch-up jobs into major refinishing jobs.

HACKSAW:

One of a family of cutting tools built on the Ouija board principle. It transforms human energy into a crooked, unpredictable motion, and the more you attempt to influence its course, the more dismal your future becomes.

WISE-GRIPS:

Generally used after pliers to completely round off bolt heads. If nothing else is available, they can also be used to transfer intense welding heat to the palm of your hand.

OXYACETYLENE TORCH:

Used almost entirely for lighting various flammable objects in your shop on fire. Also handy for igniting the grease inside the wheel hub out of which you want to remove a bearing race.

TABLE SAW:

A large stationary power tool commonly used to launch wood projectiles for testing wall integrity.

HYDRAULIC FLOOR JACK:

Used for lowering an automobile to the ground after you have installed your new brake shoes, trapping the jack handle firmly under the bumper.

BAND SAW:

A large stationary power saw primarily used by most shops to cut good aluminum sheet into

smaller pieces that more easily fit into the trash can after you cut on the inside of the line instead of the outside edge.

TWO-TON ENGINE HOIST:

A tool for testing the maximum tensile strength of everything you forgot to disconnect.

PHILLIPS SCREWDRIVER:

Normally used to stab the vacuum seals under lids or for opening old-style paper-and-tin oil cans and splashing oil on your shirt; but can also be used, as the name implies, to strip out Phillips screw heads.

STRAIGHT SCREWDRIVER:

A tool for opening paint cans. Sometimes used to convert common slotted screws into non-removable screws and butchering your palms.

PRY BAR:

A tool used to crumple the metal surrounding that clip or bracket you needed to remove in order to replace a 50 cent part.

HOSE CUTTER:

A tool used to make hoses too short.

HAMMER:

Originally employed as a weapon of war, the hammer nowadays is used as a kind of divining rod to locate the most expensive parts adjacent to the object we are trying to hit.

UTILITY KNIFE:

Used to open and slice through the contents of cardboard cartons delivered to your front door; works particularly well on contents such as seats, vinyl records, liquids in plastic bottles, collector magazines, refund checks, and rubber or plastic parts. Especially useful for slicing work clothes, but only while in use.

Son of a bitch TOOL:

Any handy tool that you grab and throw across the garage while yelling, "Son of a bitch" at the top of your lungs. It is also, most often, the next tool that you will need.



NEMES Gazette Editorial Schedule

<u>Issue</u>	<u>closing date for contributions</u>
May '10	Apl. 20, 2010
June '10	May 25, 2010
July '10	June 24, 2010



President's Corner

Dick Boucher

President's Corner is repeated due to last months meeting cancellation.

The Meeting

Our speaker this month is John Goodman. John is the fellow who had the Annosphere at our show in February along with the internal ring gear cutter and gear cutter he built to make the gears for this instrument.

John got interested in building clocks when he was in high school. He recently discovered that a simple combination of four gears could produce a gear ratio of 365.2422 to 1, enabling a clock to include a yearly cycle along with a daily cycle.

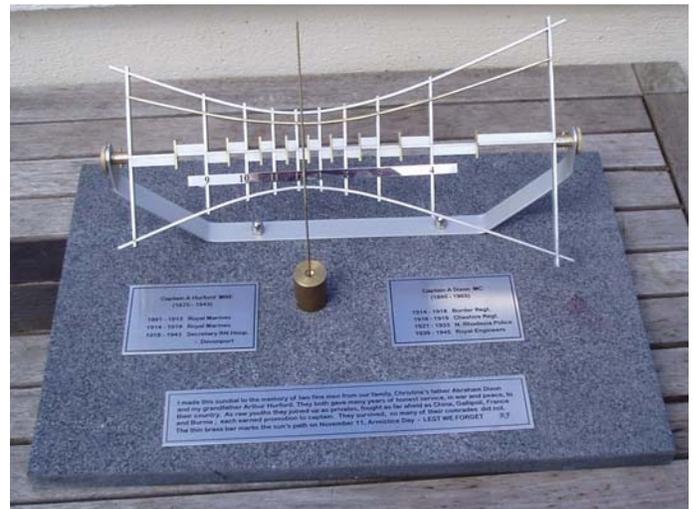
To build this clock (which he dubbed an Annosphere) he first needed to make gears; to make gears he needed to build a gear cutter. Building a prototype showed him why he needed to build a second gear cutter. As is often the case, the tools may be more interesting than the final product.

He'll be showing these tools and explaining the design process and the construction techniques of the Annosphere, supplemented with animated illustrations of the gear ratio mechanism.

Benefits of a Gazette Article

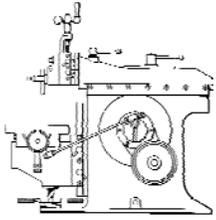
Some of our steamboat buffs may remember Roger Flood and his steam launch, Brillig, in the 80s. Roger and I worked together at Stone and Webster and then lost touch over the years.

Recently, he contacted me from Devon England where he has retired after living in Tasmania. Roger was searching on Google for astronomical models and found my article on the Laing Planetarium in the August 2006 issue of the NEMES Gazette. He contacted me and I was able to help him with drawings etc. He was able to send me some CAD drawings that I needed for another project. He also has made a model of the Kratzer sundial (drawings available from Guy Lautard) which has several engraved surfaces and I recommended the engraver that I used for my 6 planet orrery (July 2008 issue of the Gazette). It turns out the engraver is a short ride from his home and they did a fine job for him. Recently, he sent a picture of a beautiful, unique, memorial sundial he designed and made.



The article helped restore a friendship. I hope other members will consider writing short articles with pictures of their projects. They are always welcome and you never know what unexpected benefits they may bring.

Fred Jaggi



Metal Shapers

By Kay Fisher

R. G. Sparber's Gingery Shaper - Part 3

Furnace Wear and Tear

Each time I did a pour, a few more bits of refractory fell off of my lid. I am using a commercial refractory that is 5 to 20% perlite. It is an excellent insulator but very fragile. I have already faced the top of the body with black fireplace cement and it has turned out to be very rugged. So I gave the same treatment to the lid.

After waiting overnight to cool, I brushed out all loose material and wetted the surface with a paintbrush. Then I slathered on the cement, which smoothes very nicely when wet. A single layer of cardboard was placed on top of the furnace body and the newly repaired lid carefully placed down on it. The temperature of the furnace will then be slowly increased until the cardboard starts to smoke. The last time I did this it smoked for hours.

My furnace controller permits me to start heating at 3% of maximum and go up to 100%. Details are on my web site.

My hope is to go for try #4 tomorrow and hopefully get a decent front column casting. My ram pattern is ready to go, as is the cap. I also have a pattern for an angle plate. There is no lack of fun waiting to happen.

Column Front Plate and Ram Casting

Sand Doesn't Bend Very Well!

Over the last 2 days I tried over 10 times to ram up a pattern and not have the cope drop out. Yes, it was frustrating but also educational. The main thing I learned is that you can't bend sand. By that I mean that any distortion of the flask after it has been rammed can cause cracks to form. When the flask is in the horizontal position, those cracks cause sections of the rammed sand to drop out.

After receiving a lot of good advice from people on the Yahoo Gingery_machines group, I had to sort out what applied in my situation.

The first piece of advice I took was to add another set of cleats around the bottom of the cope. The idea was that with the cleats at the bottom, all weight would bear on them and there would be no drop out. But this did not work, possibly because there was more than one thing wrong.

The second piece of advice I took had to do with the rigidity of the cope. My cope, full of Petrobond, weighs about 35 pounds. I did not have handles on the sides so it was difficult to grab and lift. I found myself grabbing opposite corners and pushing in and up. Once I was focused on the problem, it was obvious that the cope was changing from a rectangle to a parallelogram. My quick and dirty solution was to add an external steel frame that would resist this distortion. This isn't pretty but works:



Steel Frame on Cope Photo by R. G. Sparber

I had to add chocks of wood so the cope could be set with the face vertical. The first try had chocks on only one side. You guessed it - I picked up the cope and promptly tried to place it on the non-chock side! Turning it over was enough vibration and jolts to cause it to drop out. You can see that I added chocks to the other side. Only the cope has this bracing since either the molding board or the bottom board always supports the drag.

Adding this bracing helped a lot. The remaining things I tried also seemed to help, but

given variations in how hard I ram the Petrobond, it is hard to be sure.

Reusing the drag caused the cope to drop out. I rammed up the drag and then the cope. If the cope dropped out away from the drag, I just put the cope back on the drag and rammed it up again. In one case, the cope's sand stuck to the drag's sand even though I used dusting powder. So I assume that the drag was rough enough to grip the cope. Subsequent drop outs were followed by ramming both the cope and drag.

I tried using 1/4" diameter rods bedded into the sand in place of ribs and gagers. It was certainly easier to install. However, I still got drop out, but it was at the same time I figured that the reused drag was sticking to the cope so I must try this technique again. These rods may act as external chillers and affect the directional freezing in the void.

I tried ramming a little lighter in the cope and it dropped out. Subsequent tries were with all of my might and drop out was greatly reduced.

My first casting for the day was with the braced cope, full force ramming, and properly placed ribs and gagers. It worked fine:



First Casting of Day Photo by R. G. Sparber

I used information in the U.S. Navy Foundry book to design the sprue, riser, runners, and gates. You can see there was a small amount of shrinkage in the riser but none in the casting.

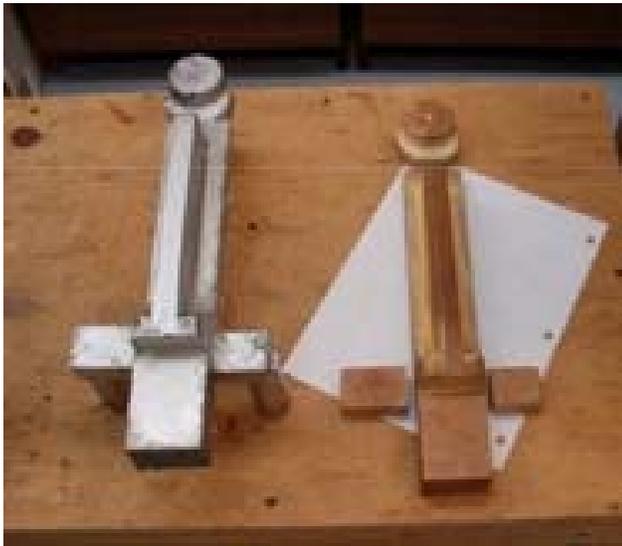
This front part is 3" longer than Gingery specifies. It is also 1/8" wider to permit the use of a second 1/8" thick gib. This will center the ram in the column.



2nd Casting of Day Photo by R. G. Sparber

My second casting of the day was the ram. It had drop out of the cope BUT I recall that my mind was wandering and I put down more than 1" of loose sand on each pass. I also did not ram as hard as I had for the first casting. I also bumped the cope as I was lowering it onto the drag.

My third casting of the day was the ram again. I was back on track except that I planned to blow out the loose sand after moving the drag to the pouring site and then forgot to do it. Once I lowered the drag onto the cope, I was not going to risk another drop out by fooling with it. The results were not bad



3rd Casting of Day Photo by R. G. Sparber

I don't think I had enough draft in the vertical rib because it was difficult to pull. You can see voids near the riser gates.



Bottom Casting Photo by R. G. Sparber

The bottom came out much better. The defect to the right of the riser gates is actually a change in thickness of just a few thou. I'm not sure of the cause but hopefully some sharp eyed expert out there will have the fix.



Ram Side View Photo by R. G. Sparber

You can see in the above picture that the vertical rib is taller than what Gingery specified. The side supports were cut to the same height. Together they are supposed to better support the cap. Also note that I did not cast in a steel core. My plan is to cast the cap, mill it and the ram body for a good fit, bolt them together with shims, and then bore out the hole on my lathe.

My final problem is that the cope is very heavy and difficult to gently lower onto the drag. I did move the drag to the pour site first and then the cope, which saved my back. But lowering it is still hard to do smoothly. If I had to do more of this, I would rig up a simple crane with a counterweight.

One or more people speculated that having my sandbox on a folding table would permit the flask to flex and be jarred which would contribute to drop out. I don't think that is the case. Although the table does move as I ram, both a $\frac{3}{4}$ " thick board and 2x4s spanning the sandbox solidly support the flask.

Tomorrow we are expecting rain so it will be a day in the shop rather than in the foundry. I am tempted to recast at least one of the side plates since I took off almost $\frac{1}{8}$ " of thickness out of $\frac{3}{4}$ " as I relearned how to mill a rough casting.

How much to melt?

For lots of reasons, it is best to only melt enough metal to fill the flask on hand. One standard way to estimate the needed metal is to weigh the pattern with its risers, sprue, runner and gates. Then apply a multiplier to give an estimate of the needed metal. I bought a digital scale from Harbor Freight (\$15) which can read out in ounces. I then weighed a few castings and their associated patterns plus sprue, risers, gates, and runners. The result for me, using mostly MDF for the patterns are that the weight of the pattern times 3 is close. Just to be safe I initially added 10%. On one pour I ended up tossing in 2 more muffin sized ingots and after the pour only got $1\frac{1}{2}$ back. So now I add 20%. Expressed differently, the estimated weight of aluminum is 3.6 x weight of all wood.

Watch for part 4 from R. G. Sparber next month. Keep sending me email with questions and interesting shaper stories.

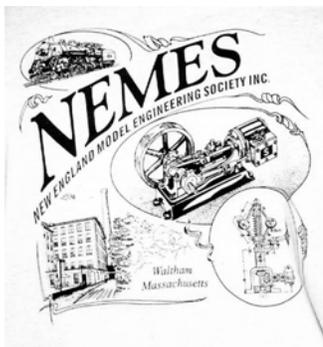
My email address is: KayPatFisher@gmail.com

Kay

NEMES Tee Shirts

NEMES tee shirts and sweat shirts are available in sizes from S to XXXL. The tee shirts are gray, short sleeve shirt, Hanes 50-50. You won't shrink this shirt! The sweat shirts are the same color, but long sleeve and a crew neck. Also 50-50, but these are by Lee. The sweat shirts are very comfortable!

Artwork by Richard Sabol, printed on front and back:



Rear

Front

Prices:

	Tee Shirts	Sweat Shirts
S - L	\$12.00	\$22.00
XXL	\$14.00	\$24.00
XXXL	\$15.00	\$25.00

Add \$5 shipping and handling for the first tee shirt, \$1 for each additional shirt shipped to the same address. Sweat shirts are \$7 for shipping the first, and \$1.50 for each additional sweat shirt. Profits go to the club treasury.

Mike Boucher
10 May's Field Rd
Lunenburg, MA 01462-1263
mdbouch@hotmail.com



Upcoming Events

Bill Brackett

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.

Bill

May 1st Connecticut Antique Machinery Museum
Spring Power Up
Kent, CT. John Pawlowski President
P.O. Box 1467, New Milford, CT 06776
<http://www.ctamachinery.com/SpringPowerUP.html>

May 2nd NHPOTP engine show
RT 113 Dunstable MA
Robt Wilkie 207-748-1092

May 6th Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry, Waltham, MA
781-893-5410
<http://www.neme-s.org>

May 16th Spring Steam-up
Waushakum Live Steamers
Holliston MA
<http://waushakum.webs.com/>

May 16th 9AM The Flea at MIT
Albany Street Garage at the corner of Albany and
Main Streets in Cambridge
<http://www.mitflea.com>

May 25th-27th 9AM-5PM
EASTEC at Eastern States Expo
West Springfield MA
www.sme.org/eastec 800-733-4763

May 29th-30th Bernardston Show
Rt 10 off Rt 91 Bernardston, MA
Vickie Ovitt 413-648-5215

May 29th American Precision Museum opens
<http://www.americanprecision.org/>

May 29-30th
Truck, Auto & Antique Aeroplane Show
Owls Head Transportation Museum Owls ME
<http://www.ohtm.org/>

June 3rd Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry, Waltham, MA
781-893-5410
<http://www.neme-s.org>

June 19th-20th

Custom Vehicles & Antique Aeroplane Show
Owls Head Transportation Museum Owls ME
<http://www.ohtm.org/>

June 19th-20th

Vermont Gas & Seam Engine Assoc Show
Brownington Stonehouse Museum
109 Old Stone House Road off 191 exit 26
Brownington VT
www.oldstonehousemuseum.org
Gail Norman 802-485-8224
gailnorman@trans-video.net

June 19th-21st Father's Day Meet

Pioneer Valley Live Steamers
Southwick MA.
<http://www.pioneervalleylivesteamers.org>

June 20th 9th Annual Van Brocklin Meet

Waushakum Live Steamers
Holliston MA
www.waushakumlivesteamers.org/?page_id=8

June 20th 9:00am The Flea at MIT

Albany Street Garage at the corner of Albany
and Main Streets in Cambridge
<http://www.mitflea.com>

June 27 NEMES display at the

North Shore Old Car Club
Topsfield Fair Grounds, Topsfield, MA
Enter main gate - Ed Rodgers (781) 233-3847
<http://nsocc.com/>

June 26th-27th Orange Show

Orange Airport Orange MA
Grover Ballou at 413-253-9574

Why No Meeting Last Month?

The museum was flooded when the Charles River overflowed. These photos give some idea of the work required to preserve the collection and restore the museum to a safe place for visitors. We believe that cleanup will be far enough along to allow us to meet this month.



To all of the volunteers who helped with recovery and cleanup, please accept our thanks.