

# The NEMES

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

# Gazette

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## Presidents Corner

Victor Kozakevich

Our member speakers for the rotary table talk each had commitments pop up, so we'll reschedule that presentation for June. Meanwhile, that gives us the opportunity to do a poster session for the April meeting. So bring those projects, tools and "what is its ?" to show and tell.

Regarding the Cabin Fever bus trip, we've had fewer than ten people sign up. So, regretfully, we'll have to cancel for this year. If you made Motel 6 reservations, be sure to cancel unless you arrange other transportation. So for those who get to go independently, please bring back your pictures and tales to share in May.

I wrote back in March that changes were afoot in the museum building. The March meeting was likely the last to be held in the Jackson Room. The April poster session scheduled will be held in the museum proper, though at the moment I'm not sure if we'll use the watch gallery or the space downstairs.

The museum is about to purchase a set of new chairs we may use. There was a discussion at the March meeting about a NEMES contribution to that purchase, but the details are still being worked out.

One of our members brought up a point about NEMES participation in future museum exhibits and activities. What kind of exhibit or event do you think the public would find interesting? Members are encouraged to contribute ideas in the form of "Letters to the editor" which will be published in the Gazette.

Another subject we discussed in March was to have a "Plan B" should some event occur that puts the museum out of service, like the flood of a couple years ago. Are there any member suggestions as to an alternative location in the Waltham area?

## Next Meeting

Thursday, April 3rd, 2014

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 David Baker) Annual dues are for the calendar year and are due by December 31<sup>st</sup> of the prior year (or with application).

Missing a Gazette? Send a US mail or email to our publisher. Contact addresses are in the left column.

## Issue Contributions Due

Issue	Contributions Due
MAY	APR 17, 2014
JUN	MAY 22, 2014
JUL	JUN 19, 2014

## Table of Contents

Presidents Corner.....	1
Shop Talk.....	2
Metal Shapers.....	2
Editor's Desk.....	4
Upcoming Events.....	5



## Shop Talk

Max ben-Aaron

At the last meeting when Fred Jaggi gave his fine lecture on Orreries, somebody told me a joke about a new hire in a machine shop. He was tasked with making a gear. Towards the end, he approached the shop foreman and asked: "Do you want the last tooth to be one fat one or two thin ones?"

Towards the end of his talk, Fred mentioned the Antikythera device. Some authorities believe that Archimedes may have made the Antikythera machine, although one could argue that the particular techniques for its construction were known to others too. The fact that it appears to have been expertly repaired speaks to this.

I became interested in the device many years ago after attending a lecture by Derek de Solla Price. This was before modern methods like MRI were used, so not a lot was known about it. I wondered what shape was used for the gear teeth and was able to determine that they were triangular. The largest gear had 223 teeth. They seem to be very regular. I cannot imagine any ancient technician, even the near-legendary Daedalus, being able to make such a gear without some sort of dividing head.

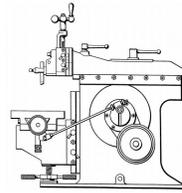
Archimedes is credited with inventing (or at least knowing about) the eponymous screw pump, so, presumably, he might have understood worm gears. I cannot prove it, but it seems highly likely that he also knew about worm wheels. Draw your own conclusions.

It is surprisingly difficult to make a flat surface good enough to be a mirror if you don't know how. My impression, looking at ancient mirrors is that the technique used for making telescope mirrors (grinding two disks together) was known in ancient times and very long focus mirrors, which are almost flat, were ground and polished as (cosmetic) mirrors. Again, I would guess that Archimedes knew this, and he used the same technique to make the mirrors he supposedly used to set enemy warships alight in defense of Syracuse. These would have benefited from very long foci, to be used at long range. This use of mirrors to set ships alight at long range was supposedly debunked, but my money is on Archimedes.

He is also credited with inventing the block and tackle and all about levers. "Give me a place to stand and I will move the earth".

It has been said that, at dawn, small sticks cast long shadows. Think about the time that Archimedes lived and what was generally known at that time, and you will understand what an intellectual Colossus he was.

Google 'Archimedes' to read more.



## Metal Shapers

Kay Fisher

### R. G. Sparber's Gingery Shaper - Part 47

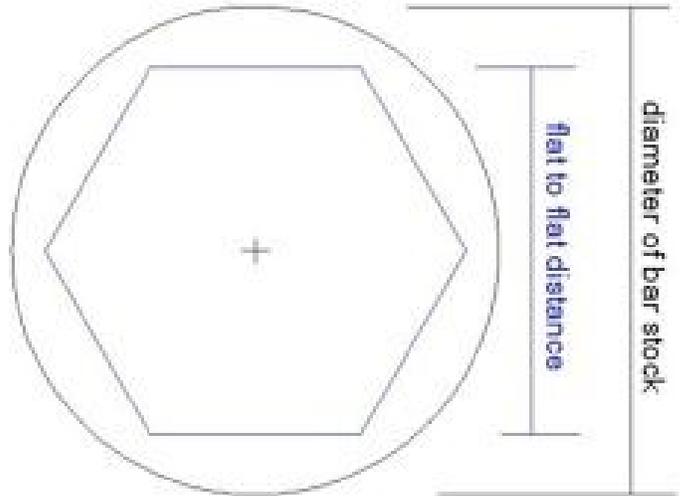
#### The Cross Slide and Cross Feed Assembly (1 of 5)

Gingery suggests we build and install the cross feed assembly (pages 104 through 106) and then install the cross slide. Given all of the changes I've made to the thickness of the associated parts, I decided to do a dry fit before drilling holes. For that reason I have merged the building of the cross slide with the cross feed assembly.



Cross Feed Screw & Nut Photo by R. G. Sparber

I mostly followed the book on this part. The one exception was that I made the coupler nuts from bar stock. It took less time than running off to the hardware store and was certainly more fun. These couplers and the nut were cut from 12L14 steel.



Nut Drawing Drawing by R. G. Sparber

The first step in making a coupler is to measure the OD of my round stock and the flat to flat distance of a  $\frac{3}{8}$ "-16 nut. By taking half of the difference between the diameter and the flat to flat distance we know how far down to feed the end mill to cut the flats. In this case it was 0.032".



Bar Stock in Spin Collet Photo by R. G. Sparber

The end of the bar stock is first squared up on the lathe and a center hole drilled. Then it moves to the mill.



Hex Cutting Done Photo by R. G. Sparber

The remainder of the flats came out fine.



Increased Feed Photo by R. G. Sparber

I tried to feed down the full 0.032" and go for a single pass on each flat, but this didn't work. The cutter grabbed the bar and rotated it about 45 degrees. You can see the main flat in the picture and the bad flat on the left side. I have already re-positioned the bar to put the main flat back on top. It won't look good but the resulting coupler will be functional. So I continued with only 0.016" deep cuts.



Result Photo by R. G. Sparber

The finished hex is functional, but not pretty. It is back to the lathe to drill, tap, and part off the two coupler nuts.



Drilling Nuts Photo by R. G. Sparber

The tap hole is drilled about 2" deep.



Tapping Nuts Photo by R. G. Sparber

With the chuck locked, I tapped in about 1". This is enough for the first coupler and as far in as the tap can reach. I then touched a file to the end to slightly round it. The parting tool is positioned to cut a 3/4" piece. Before cutting through, the file is touched to the groove to slightly round the end about to be cut off. Using a file on a running lathe is not the safest operation. At the very least, be sure you have a rounded handle attached so you are not impaled on the tang if it kicks back.

After parting off, the tap is again run in as far as it can go. The end is rounded, the parting tool set at 3/4", and the second coupler is cut off.



Finished Nuts Photo by R. G. Sparber



Nuts Mounted Photo by R. G. Sparber

The end pieces are 3/8" CRS. I turned down the first 0.5" of them to the minimum OD for a 3/8"-16 thread. This made running the die a lot easier. The ends were cut square.



Mounting Rod in Chuck Photo by R. G. Sparber

The ends of the threaded rod were also cut square. Note the use of 3/8"-16 nuts with a cut in them to hold the rod in the chuck without damaging the threads. This arrangement has limited holding power so light cuts are made. Given that all ends are square, they should seat squarely as they meet inside the couplers.

There is not much to say about the nut. I first drilled and tapped the 3/8"-16 hole, then drilled the 1/4"-20 tap hole until it broke into the 3/8" hole. A 1/4"-20 tap was then used, being careful not to hit the 3/8"-16 threads. The 3/8"-16 tap was used a second time to clean up the burrs made by the 1/4"-20 tap.

Stay Tuned for part 48 from R. G. Sparber next month.

Keep sending me email with questions and interesting shaper stories.

My email address is:  
[KayPatFisher@gmail.com](mailto:KayPatFisher@gmail.com)

Kay



## Editor's Desk

George Gallant

Publishing the Gazette changed hands this month. For over 10 years Bob Neidorff has overtly push the Gazette thru the printer, affixing labels, and going to the Post Office. Covertly he has served as the spelling and grammar checker. Thanks Bob!!!

You should notice that the Gazette is light this month. That means I did not get your submittal.

As the only dissenting vote regarding funding the chairs for the museum I feel that I should qualify my position:

1. I did not like having a "vote" on an issue that amounts to approximately 10% of the club's resources without advance notice.
2. I did not like conditions being placed on the donation.
3. I am not against paying for use of the room or donating to the museum. Lets make it official.



## Upcoming Events

Bill Brackett

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

[thebracketts@verizon.net](mailto:thebracketts@verizon.net) or 508-393-6290.

April 3rd Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry 781-893-5410  
Waltham, MA

April 11-13th  
Cabin Fever Expo Bus trip  
Dick Boucher 978-352-6724  
<http://www.cabinfeverexpo.com/>

April 26-27th NAMES Expo  
Yack Arena Wyandotte,MI  
<http://www.namesexposition.com/expo.htm>

April 13th 9:00am The Flea at MIT  
Albany Street Garage at the corner of Albany and Main  
Streets in Cambridge

April 27th Belltown Antique Car Club  
Gas and Steam Show  
East Hampton Ct  
<http://www.belltownantiquecarclub.org/shows/engine%20show%20main.htm>

May 1st Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry 781-893-5410  
Waltham, MA

May 3rd Connecticut Antique Machinery Museum  
Spring Power Up  
Kent Ct. John Pawlowski President P.O. Box 1467, New  
Milford, CT 06776  
<http://www.ctamachinery.com/>

May 3rd NHPOTP engine show  
RT 113 Dunstable MA  
Robt Wilkie 207-748-1092

May 19th Spring Steam-up  
Waushakum Live Steamers  
Holliston MA