

# The NEMES

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

# Gazette

No. 203

March 2013

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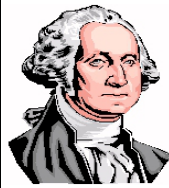
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David Baker  
Bill Brackett  
Dick Boucher  
Kay Fisher  
Nick Jones



## President's Corner

Dick Boucher

### The Meeting

Our usual meeting space is unavailable for holding the March 7<sup>th</sup> meeting. However, Howard Gorin has arranged for members to tour the Waterworks Museum in Chestnut Hill. Parking may be limited so try to arrange carpooling. The museum is located at 2450 Beacon St., Boston. Their website is:

<http://www.waterworksmuseum.org/>

### Miscellaneous Ramblings

Not much to ramble on again this month except to say what a wonderful Model Engineering Exhibition we had this year. Many thanks are to be given but I always hesitate to start least I forget someone, but here goes:

First, to Norm Jones and Bill Brackett for engineering and assembling our new manifold for the air supply. Then we have Ray DesChamp who spent the day operating and giving a wonderful history/explanation of the Linotype machine on the first floor. Next I want to thank Howard Gorin for getting Ray for us and also the use of the air compressor from Canizio Contracting in Lexington MA.

The really big thanks goes to Our Ladies Auxiliary under the able leadership of Gail Martha assisted by great volunteers: Leslie Jones, Sue Brackett, Lisa Baker, Terry Groff and Bea Boucher. The efforts of these fine ladies provide us with the funds to make the show a financial success for us.

Our new treasurer David Baker deserves a word of thanks. In past years David has had quite a number of pieces of his creations operating, this year he had just a couple small steam engines on his table but he devoted the

## Next Meeting

Thursday, April 4th, 2013

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

APR	MAR 21, 2013
MAY	APR 18, 2013
JUN	MAY 23, 2013

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entire day to recruiting new members to the Society. At last count he brought in twenty new members.

I also want to thank Elln Hagney's crew for all their help in setting up and tearing down when we finished, and to Elln and Charles River Museum of Invention and Innovation for allowing us once again to have our show at the facility.

Many thanks to the many donors of gifts for the door prize. I know there was one young fellow that won a box of Home Shop Machinist Magazines and though he usually has a big grin on when he is among us, he was grinning from ear to ear with that prize.

A special thanks to Dave Piper's kids who us helped with the cleanup. His daughter was seen pushing the large dry mop around the hall and his wife was heard to say, "I wonder if she will remember how to do that when she gets home".

Now, last but not least I want to thank all of you who showed up and set up your displays. The show would be absolutely nothing without you. Exhibitors seemed a little down this year along with the spectators but I am sure the weather forecast for the day had a lot to do with that. For those of you who are usually at the show

Here are links to show photos. The first is from Mark A:

<http://www.flickr.com/photos/79915726@N05/sets/72157632780039719/>

The second is Dick Koolish's take of the show:

[http://www.dickkoolish.com/rmk\\_page/pictures\\_02\\_1613.html](http://www.dickkoolish.com/rmk_page/pictures_02_1613.html)

And of course Errol Groff has some fine imagines on our web site at:

[www.neme-s.org](http://www.neme-s.org)



**Editor's Desk**  
George Gallant

Once again we approach the annual club elections. I have a feeling that Dick really is NOT going to continue to be president. I have a list of 6 members who have the skills and the demeanor to assume the position and if I know 6 there must be at least a dozen more! While I'm on a rant I would also like to see the club forgo the annual dues for elected officers.

Second gripe, we need contributors to the Gazette. I can correct your spelling, punctuation, gamma and insert the pictures. However I am not a machinist and do not have any contacts in the industry.

The annual show clearly demonstrates that a lot of work went into planning and building your projects. Let the rest of the community in on the details. Send your articles to: [editor@neme-s.org](mailto:editor@neme-s.org).



## **Treasurer's Report**

David Baker

We had a good show this year. We had significantly more income than previous years (by previous years I mean 2010), but our expenses were higher because of the manifold. As follows:

### **17<sup>th</sup> Annual NEMES Show Accounting**

Clothing Sales:	\$204.00
Donations:	\$504.31
Table Rental	\$(356.80)
<u>Manifold</u>	<u>\$(332.95)</u>
Total	\$18.56



## **Tool Corner**

Frank Dorion

Drilling holes in metal seems like it should be a simple job, but it does have its complications. One common and potentially dangerous problem can occur when the drill is just breaking through the bottom surface of the item being drilled, particularly when using a drill press. The cutting lips of the drill tend to grab the thin section of metal left at the bottom of the hole and the drills flutes will act like a screw thread to jack the workpiece up the drill, spinning the workpiece out of control. Not good! Even if you have heeded the frequently encountered advice to clamp your work, you still could experience some excitement. I have a very vivid recollection of seeing a workpiece that was clamped in a substantial drill press vise climb the drill, vise and all, and spin around madly until the drill snapped off and the vise went flying.

As mentioned above, this problem is more frequently encountered when using a drill press because of how a drill press works. On an average drill press, the mechanical advantage provided by the quill feed lever is about 15 to 1. Just 5 pounds of pressure on the lever translates to 75 pounds of pressure at the drill point. Heavy feed pressure makes the drill tear through the last thin layer of metal at the bottom of the hole, exacerbating the grabbing action described above. So, at the minimum, try to ease up on feed pressure as your drill approaches the bottom of the hole. Better yet for larger drills, if possible, move the job to your milling machine and drill the hole by moving the knee up to feed the work into the drill. This gives a much more even and controlled feed, decreasing the likelihood of problems when the drill breaks through. If you don't have a knee mill, perhaps your mill has a fine quill feed option that would help produce a controlled rate of feed.

Another reason drills tend to grab, especially in brass, is

because of the aggressive rake angle on the lips of a conventional drill point. That aggressive rake angle can cause the drill to self-feed, making it jump forward and take a heavy bite into the soft brass. This bad behavior can be reduced or eliminated by stoning a small vertical flat on each lip of the drill, converting it to a “zero rake” cutting tool similar in principle to the tools you would use on brass in a lathe. The flats don't have to be large, but they should be wide enough to be clearly visible. I have found that an inexpensive fine-grit diamond hone, the kind with the plastic handle (seen here: <http://www.rockler.com/product.cfm?page=2414> ), is an excellent tool for modifying drills in this fashion. Once so modified, the drill will perform well in brass, but it will be less efficient in steel. For this reason, I bought an empty drill index to use specifically for drills modified for drilling brass. I have been slowly building a complete set of such drills by modifying one of each size as the need for that size arises.

Here's another drilling tip that struck me at first as being completely off the wall, so of course I had to give it a try. In the December, 2011 issue of Model Engineers' Workshop, an English publication, author Mick Knight offered a remedy for a problem frequently encountered when drilling larger holes. In my case, I was drilling a 5/8" diameter hole, using a 1/4" drill to create a pilot hole first. I commonly drill pilot holes for larger drills and find that the larger drill tends to bounce around as it enters the pilot hole, chewing up the rim of the hole and generally giving a very rough start to the hole. Sometimes this bouncing will continue well down into the hole, leading to a rough, oversize hole. So, anticipating this problem, I recalled Mick Knight's tip and decided to give it a try.

Here's what Mick suggests: “Take a strip of worn emery tape and fold it double with the carborundum to the inside. Place this on top of the hole and carefully feed the drill down. The emery tape will initially fill the larger drill flutes and so the cutting lands will start to cut cleanly, resulting in a clean and round bore.” What Mick is calling “emery tape”, we would call cloth-backed abrasive strip, the kind that commonly comes in 1" wide rolls for general use around the shop. Scrap pieces from a worn out abrasive belt would work too, I think.

Tear off a piece of the abrasive strip that will be wider when folded in half than the diameter of the drill you are using. Fold it with the abrasive surface on the inside. Then follow Mick's instruction. The drill's smooth entry into the pilot hole has to be experienced to be believed, and the resulting hole was a beautiful thing to contemplate. I had reservations about how the abrasive might affect the drill's cutting ability, but a careful examination of the drill's cutting edges showed them to be still quite sharp after passing through the abrasive paper. The abrasive might accelerate wear on the drill after extensive use of this method, but the improvement in the quality of the drilled holes makes a regrinding of the drill well worthwhile.



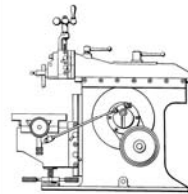
## ***Shop Talk***

Max ben-Aaron

Our splendid ladies auxiliary came up trumps once again with delicious snacks and lunches. The process starts around SuperBowl time when supermarkets want to draw customers in to purchase snacks and drinks to enjoy while watching the game because the profit margin on these items is very high. So they offer excellent sales in the weeks before, like 'buy one get one free'. Dale Martha, crew chief, noticed this, so she does her planning to coincide. By the time the sales come on she has a list of what she needs to buy for the Show.

With the able help of Lisa Baker, Bea Boucher, Sue Brackett, Terry Groff and Leslie Jones the ingredients get converted into the mouth-watering display of goodies that appears at the show. In addition to tempting cookies and cakes there are hot dogs and delicious sandwiches - chicken-, ham- and egg-salad.

I'm happy to take this opportunity to pay tribute to the superb lunch crew, on behalf of the exhibitors and the public attending the show.

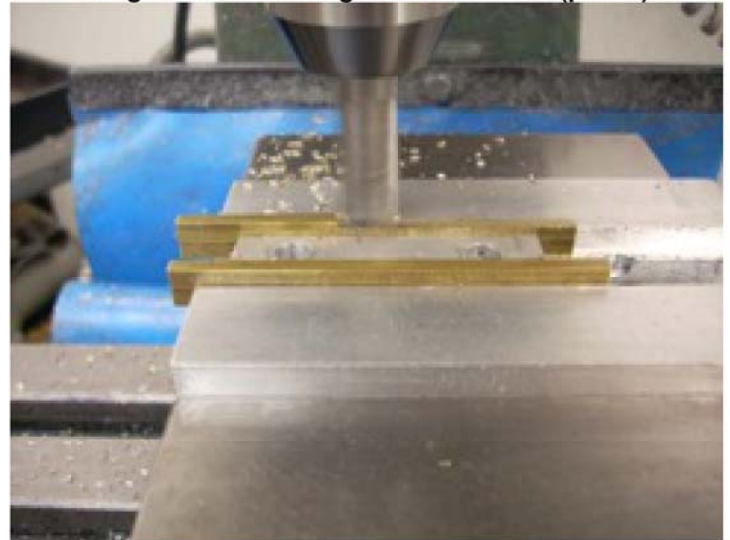


## ***Metal Shapers***

Kay Fisher

### R. G. Sparber's Gingery Shaper - Part 34

#### **Machining and Assembling the Down Feed (part 4)**



Milling Brass Strips Photo by R. G. Sparber

When I was cleaning up the casting, I did not think about the spacing between clamp supports. I just wanted to remove the mess. When I trial fit the slide, it became obvious that I lucked out. A 1/8" strip of brass on each side would nicely fill the gap. Here I am machining the height of the brass strips to 0.240" to match the height of the clamp supports. One

strip is the gib and the other was glued in place with Loctite®.

The spacer is used because I want the brass strips supported by the steps of the soft jaws but the step is wider than the brass is thick. I tried putting both strips on one step and the spacer on the other soft jaw. This did not work because one of the strips inched up a little. So I made two passes and both strips stayed firmly bedded.



Gib Screw Hole Photo by R. G. Sparber

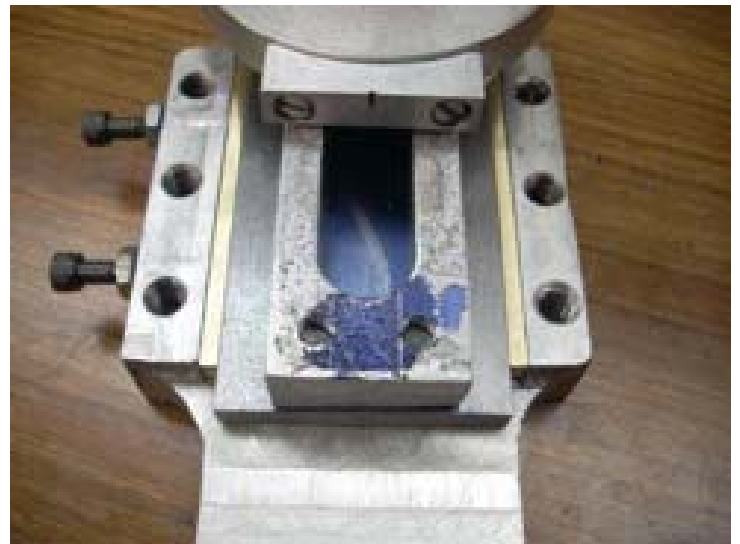
The casting has been set up in the vise and the gib screws are being set. There is not much metal between the wall of the hole and the top of the clamp support block. I chose to put the gib screws 0.120" from the edge so the force on the gib would be centered. The problem with doing this is that I'm very close to breaking through.



Gib Screw Break Out Photo by R. G. Sparber

Like I said, there is not much room. In hindsight, it would have been better to set the clamp plate with the 3 screws in place. It would have backed up the thin aluminum area and prevented the breakout.

This looks bad but is not a big deal. I just filed the damaged area flat so it does not interfere with the clamp. Yes, I know it is there but, given the countless little screw-ups I've done on this project, I may not even remember this one.



Part Build Up Photo by R. G. Sparber

The assembly so far is looking good.



Marking Casting Photo by R. G. Sparber

It is now time to transfer the exact center of the slide to the front face of the casting. I know that my slot is 0.625" wide. Using my digital height gage, I set zero at the lower face of the slot and then came up by 0.3125". This height was then marked on the casting.



Marking Casting 2 Photo by R. G. Sparber

I then placed Reference 1 down on the surface plate and

zeroed my height gage at the top of the slide plate. I then touched down on the top of the casting area that holds the slot. Dividing this number in half gives me the center of the slot in the vertical dimension. I then scribed a horizontal line on the front face of the casting, transferring the center of the slot to the front of the casting.



Casting on Mill Photo by R. G. Sparber

The casting is now back on my mill. Reference 1 is clamped to one knee. Reference 2 is pressed up against a second knee. I then used a spud to get the center of the spindle aligned with my scribe marks.

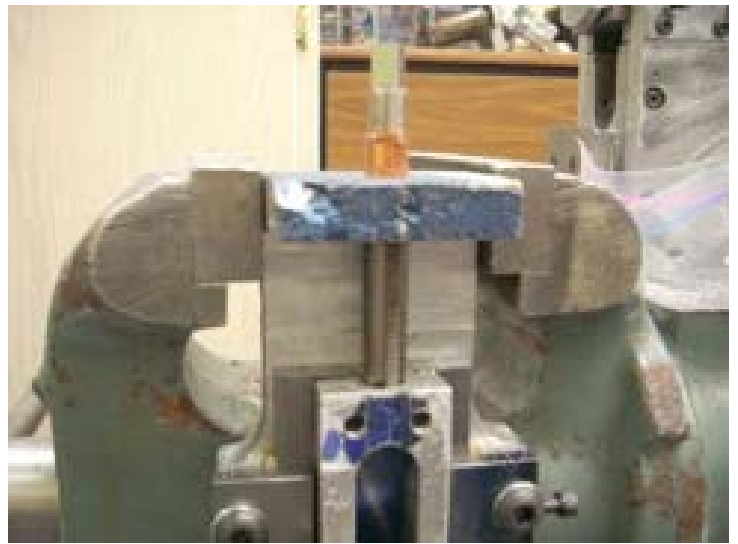
Note that I keep my vise as far to the left as possible on my mill table. That gives me room for setting up a clamp system directly on the table without having to disturb the vise.



Casting on Mill 2 Photo by R. G. Sparber

This is another view of the set up. Reference 2 is in contact with the knee on the left.

With the casting aligned and secured, it was then a simple matter to step drill through both the down slide and slide castings. I started with a  $1/8$ " drill and ended with a  $25/64$ " drill which is the tap drill for a  $7/16$ "-20 thread.



Tapping Hole Photo by R. G. Sparber

The casting was moved to my bench vise. A  $7/16$ "-20 tap was placed in the slide's hole. The shank of the tap fit into the down feed's hole. A strip of copper sheet was wrapped around the shank to keep it close to centered and the hole was tapped.



Down Feed Assembly Photo by R. G. Sparber

For all of my minor errors, the resulting part looks good to me. My guess is that a typical machinist makes many minor mistakes when making a one-off part. If they are making a second identical part, they get a second chance to get it all right. The procedure would be modified so future parts would not suffer from these mistakes.

I did forget one step. The outside of the feed screw support must be cut flat so it can accept the feed dial pointer. I'll leave this for another day.

Stay Tuned for part 35 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)



## Circuit Corner

Nick Jones

Editor: This is a compilation of pictures and text published by Nick Jones on the EDMHomeBuilders site. I hope I correctly extracted the meat of his postings. Nick can be reached at: [nick@lydwood.co.uk](mailto:nick@lydwood.co.uk). GG

This was done with Ben Flemming's original RC EDM design which I built a good few years back.

I don't use it that often but when I do I'm usually in trouble and this time was no exception. There are descriptions against the photos but in short I wanted to realign the headstock on a fairly large lathe and when undoing the cap screws which attach the headstock to the main bedway casting, one of these sheared. On this machine they are concealed in recesses within the headstock casting, so there's no access directly above to drill them out or use any sort of stud extractor. I figured that this little EDM could probably hold an electrode on the end of arm to get in there and spark a hex into the sheared off 5/8" UNC stud. This is the first job I've done with the part not in the EDM tank but it worked really well. It took probably 2 hours to spark a 1/4 hex about 1/4 Deep but a lot less hassle than lifting the entire headstock off the lathe.

This is the Colchester Mastiff Lathe. It's a decent size machine and will swing about 32" diameter in the gap.



Here's the broken 5/8 UNC cap screw. The rest of it is deep down inside that recess in the headstock casting. It would be a lot of work to remove the entire headstock to gain access to drill this out.



Here's a graphite electrode mounted in a brass bar. There's a 1/4" hex on the electrode and also centre flushing



The electrode is roughly centered on where it needs to plunge, the surface of the rest of the cap screw is about 1.25" down in.



The electrode is plunged down to the top of the job and centre flushing pipe connected, ready to spark out



Here's the complete set up. The Servo head is conveniently mounted onto the lathe's toolpost and the electrode is on the end of the brass bar, within the lathe's headstock casting.



The tank, with pump, filters etc is on the headstock and supplies the centre flushing to the electrode. Most of the fluid is caught and reused. There's actually only a small flow once the electrode starts entering the work.



The end result is one very awkwardly buried broken cap

screw is extracted from the lathe's headstock casting. This broke when I slackened it, not when I did it up, but it was very tight! I guess it must have "nearly sheared" when the last person in there tightened it.





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

March 7<sup>th</sup> at 7PM – Chestnut Hill Water Works Museum  
 In lieu of the NEMES meeting, Howard Gorin arranged a tour of the Chestnut Hill Water Works Museum. They have limited parking, so please try to carpool.  
 2450 Beacon St. Boston MA  
<http://www.waterworksmuseum.org/>

March 23-24th Midcoast Model Festival  
 Owls Head Transportation Museum Owls ME  
<http://www.ohm.org/>

April 4th Thursday 7PM  
 NEMES Monthly club meeting  
 Charles River Museum of Industry 781-893-5410  
 Waltham, MA  
<http://www.neme-s.org>

April 12-13<sup>th</sup>  
 Cabin Fever Expo - Bus Trip  
 Must contact Dick Boucher ahead of time 978-352-6724  
<http://www.cabinfeverexpo.com/>

April 20-21 NAMES Expo  
 Toldeo, OH  
<http://www.namesexposition.com>

April 13-14 Woods Hole Model Boat Show 2013  
 Wood Hole MA (Happens every other year)  
<http://www.woodsholemuseum.org>  
 (508) 548-7270

April 14th 9:00am The Flea at MIT  
 Albany Street Garage at the corner of Albany and Main Streets in Cambridge  
<http://www.mitflea.com/>

April 28th Belltown Antique Car Club  
 Gas and Steam Show  
 East Hampton Ct  
<http://www.belltownantiquecarclub.org/shows/engine%20show%20main.htm> or  
<http://tinyurl.com/dyh6zoc>



### MEMBERSHIP FORM

For 2013 Calendar Year

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone (\_\_\_\_) \_\_\_\_\_ New [  ]

(\_\_\_\_) \_\_\_\_\_ Renewal [  ]

EMAIL \_\_\_\_\_

Please enclose form in an envelope along with \$25 cash or check made payable to NEMES. Dues can be brought to the next meeting or mailed to our treasurer:  
 David Baker  
 288 Middle St.  
 West Newbury, MA 01985