

# The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 183

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<http://www.neme-s.org>

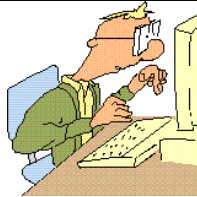
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### Editor's Desk

Frank Hills

### Squeaky Wheels And Such

I'd like to say "thank you" to everyone who responded to my tirade last month. It looks like squeaky wheels really do get the grease when it comes to a group that builds things themselves. I was surprised to receive E-mails from all over the United States, encouraging, inspirational, even instructional messages that I won't quickly forget. I ask you not to forget either, because without some of those E's this months Gazette wouldn't be what it is...the best one we've had in years!

We've got what I hope will turn into a new monthly article, "Tool Corner" by Frank Dorian. I figure if anyone should know about tools, it's Frank. We also have an article this month from Rolly Evans talking about his rebuild of a Stanely Steamer engine. Engines are my favorite subject. Any kind of engine! However, I must apologize to Rolly. I ran out of room for all of his great Pics and wasn't sure where to place some of them. I hope I got it right!?

### Next Meeting

Thursday, July 7th, 2011

7:00 PM. Meetings held at:  
Charles River Museum of Industry  
154 Moody Street  
Waltham, Massachusetts

### Membership Info

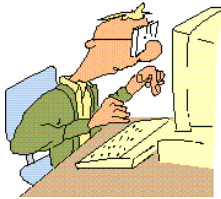
New members welcome! Annual dues are \$25 (mail applications and/or dues checks, made payable to "NEMES", to our Treasurer Richard Koolish, see right) Annual dues are for the calendar year and are due by December 31<sup>st</sup> of the prior year (or with application).

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

Addresses are in the left column.

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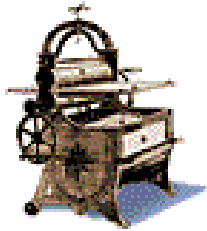


## **Editor's Desk**

-continued from page 1

I think you're going to love this issue...and with continued contributions from you guys (and girls!) I'll improve my editing Skills. I'm still not sure how all these word processing functions work! Enjoy, friends!

Frank Hills



## **NEMES Gazette Editorial Schedule**

<u>Issue</u>	<u>closing date for contributions</u>
August 2011	July 22, 2011
September 2011	August 19, 2011
October 2011	September 23, 2011
November 2011	October 21, 2011



## **President's Corner**

Dick Boucher

### **The Meeting**

First let me say thank you to all the members present at the June meeting for once again electing me as the president of this prestigious organization.

July and January are my favorite meetings of the year. We don't have a guest speaker and we don't have to haul out all the sound and projection equipment but most of all I get to see the handy work from all the fellows who bring in some of their projects. In review, these meetings are sort of what Ron Ginger's original idea was for our group, that is just getting together to share our projects and ideas with each other. Well, we have come a long way

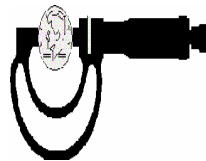
from the original intentions but I still love the Poster Sessions, so please don't disappoint me and please bring something to the meeting whether it is an elegantly finished recently completed very complex model, a good start on something or just a piece of tooling or a fixture you have used on a recent project to share. To borrow a saying from the **S Gauge Herald** "knowledge is useless unless shared".

## **Miscellaneous Ramblings**

Some of us rambled up to Moultonborough NH this past month for a steam gathering hosted by Gabrielle and Bob Wallace. The day was spoiled weather wise by quite a bit of heavy rain moving through the area but the day was still a very positive time with all the gatherings in the Wallace's many buildings. In between the rain, steam was raised in the various models with their own boilers and the Granite State Gas and Steam Engine Association portable boiler and steam table was in steam all day long along with Ed Howard's Colt Firearms boiler and engine combination. What a great model this would make...everything in one unit just ideal for the engine-show circuit.

The writings seem short this month but believe me, Bea and I have been very busy. We have celebrated second and fifth birthdays with grandchildren Ainsley and Joshua and I have been very busy with my adventures in the teaching field.

Dick B.



## **Tool Corner**

By Frank Dorian

In the most recent Gazette, Frank Hill, our esteemed editor, wrote of his frustration over the apparently poor readership of the Gazette and the lack of content contributions from the membership (that's you and me!). Having edited a similar newsletter for many years for another group, I'm sympathetic to Frank's plight. So, to try to do a little to improve the situation, my thought is to provide a regular piece for the Gazette, hopefully monthly, on the subject of tools, both simple and complex, that we use in

pursuit of our hobby. There are so many neat tools out there and so many ways to use them that I think I can keep a series going for quite a while without running out of material. There is an opportunity for member participation here too. If you have an unusual or interesting tool that you feel would be of interest to the NEMES membership, please let me know and I will be happy to photograph it and write it up for the Gazette.

So, let's talk about this month's feature tool, a variation on the adjustable bevel. The simple adjustable bevel is a very handy tool with many applications, but it has its limitations. In this case, the most significant limitation is that, while a single bevel works well for measuring obtuse angles, as the angle you are measuring becomes more acute, you start running out of room on the bevel's gauging surfaces. To see what I mean, take a look at Photo 1 below.



The simple bevel works fine at 45°, but when you get down to 30°, there's not enough contact area on the bevel's gauging surfaces to assure an accurate measurement. An acute angle of 10° can't be measured at all. There were a few solutions developed to address this problem, but we are going to limit this discussion to the simplest one, the universal bevel.



Photo 2 shows an assortment of three universal bevels I have in my tool chest. The smallest one and the middle size were made by Starrett. Brown & Sharpe made similar bevels. The largest bevel in Photo 2 is a cheap tool with a pot metal beam and a stamped steel blade made in the USA by TWIX a few decades ago.



In Photo 3, you can see one of these bevels being used to measure a 1° angle, something that's not possible to do with a simple bevel. Another nice feature of universal bevels is that they will also measure any angle that can be measured with a simple adjustable bevel.



Photo 4 shows a "Universal Bevel" that is still in Starrett's catalog, but I don't think it's nearly as versatile as others. The "dog leg" section has been shrunk down to just a little jog in the blade slot, limiting its usefulness in measuring acute angles. Plus, it's a pain to move the beam from one slot to the other. And, trust me, the beam will always be in the wrong slot when you pick it up to use it.

So, why aren't all bevels made in the universal pattern? The additional complexity of grinding the "dog leg" on the universal bevel increases the cost of manufacture significantly. Also, the universal style blade would be tricky to heat-treat without getting some spoilage due to warping. Add to that the general decline in the use of machinist's hand tools and you have another tool slipping quietly from the pages of the Starrett catalog into obsolescence.

By the way, if you happen across one of the TWIX bevels shown above, don't turn your nose up at it because it's a cheap utility tool. Spend a bit of time taking a skim cut off each edge of the beam to remove the casting flash and then refine the stamped edge of the bevel blade a bit. You will then have a very serviceable tool that will prove to be a valuable addition to your toolbox. And if you want one, but can't find one, how about making one from scratch? For home use, an unhardened version, handled carefully, would remain accurate for a very long time.



## ***Metal Shapers***

By Kay Fisher

### **R. G. Sparber's Gingery Shaper - Part 16**

#### **Machining a 4-Step Pulley - Continued**



**Mounting on Chuck** Photo by R. G. Sparber

Being careful to avoid the lump on the small end's surface, I am bedding the casting into my 3 jaw chuck. My drill chuck is applying light pressure as I tighten the jaws. Careful inspection of the contact between jaws and casting insures the part is properly bedded.

I used my cutter to verify the casting is bedded. By slowly turning the chuck by hand, I can see the gap between cutter and wide face. It looks good.



**Checking Runout**

**Photo by R. G. Sparber**

Machining this part so precariously held in the chuck would not be smart. However, it is fine for drilling a hole so a mandrel can be fitted. The finish hole in the pulley will be  $\frac{5}{8}$ " so that will be the diameter of my mandrel too. I drill starting at  $\frac{1}{4}$ " and going in  $\frac{1}{8}$ " steps to  $\frac{5}{8}$ ".



**Drill Doctor** Photo by R. G. Sparber

Before using each drill, I sharpen it on my Drill Doctor®. I don't own stock in this company nor sell them. However I do benefit from their product every time I drill a hole. All but my  $\frac{5}{8}$ " drill fit.



**Drilling**

**Photo by R. G. Sparber**

Step drilling minimizes the force on the chuck to avoid any "excitement". The twisting force from hogging with a large drill can cause the casting to fly off.

The most time-consuming hole was the first one. I used plenty of cutting fluid and went in 1" to 2" at a time. After going in a short distance, the drill was removed and cleaned of chips. More fluid was sprayed into the hole and the cycle repeated. The larger the hole, the more room for chips but I still went in only 1" to 2" at a time.

The mandrel is just a piece of  $\frac{5}{8}$ " steel with both ends center-drilled to take the dead and live centers. The mandrel was fitted to the casting and moved to my mill/drill where the set screw hole was drilled and tapped.



**Mill Setup for Set Screw Photo by R. G. Sparber**

In my continuing effort to avoid "excitement", time was spent being sure the casting was securely anchored to the mill's table. The casting was supported by the mandrel. The mandrel was supported in V blocks set on 1-2-3 blocks. Hold down clamps pressed down on the top of the mandrel. To prevent rotation of the casting, a large C-clamp pushed against the ends of the V blocks.

I did my best to eyeball the centerline. It would have been more precise if I had set my V-blocks true but this was good enough.

My tap can thread about 1" of hole but this hole is around 2" deep so I drilled a clearance hole for the tap body down  $1\frac{1}{2}$ " and then the tap hole the last  $\frac{1}{2}$ ". The set screw is about  $\frac{1}{4}$ " long so this is plenty of thread.

Somehow I misjudged the thickness of the aluminum by about  $\frac{1}{4}$ " and drilled into the mandrel. This turned out to be helpful since the setscrew locked into this hole to better prevent rotation of the casting on the mandrel without leaving a burr.

With the mandrel fixed to the casting and a dog added, the assembly was mounted onto my lathe.



**First Lathe Cuts**

**Photo by R. G. Sparber**

Initially I used a generic cutting fluid from Enco which worked OK but WD-40 gave better results so the remaining work was with it.

The wide end of the casting was cleaned up first and while I was at it, I turned the largest diameter. The assembly was then turned end for end to reach the remaining steps and the narrow end.



**Cutoff Tool Marking**

**Photo by R. G. Sparber**

Above you see that all four steps have been finished to their final diameter and the narrow end faced off. I measured the overall length of the part

and calculated the center line of each groove. My cut off tool was then used at each centerline to cut down to the bottom of each groove. A second pulley will be made later and it will match this spacing of grooves.

The depth is not a precision dimension. I just want to know when I'm in the neighborhood. Note that the largest diameter groove is a bit wider. I initially tried to mark the depth with a regular round nose cutter but it was too much of a load.



**Right Faces Cut** Photo by R. G. Sparber

The compound was set to 17 degrees. I initially mounted a round nose cutter at this same angle. This worked OK but I later realized that the cutter is best set perpendicular to the mandrel or even pointing towards the surface being cut if there is no interference with the opposite face of the groove. Here you see the right face of each groove done. I eyeballed its placement. The left face will be set, as per the plans, to the width of 0.494”.



**Left Faces Cut** Photo by R. G. Sparber

The left face of all grooves is now done. The surface was a little rough so I used 120 grit emery cloth to improve the finish.



**Finished** Photo by R. G. Sparber

In hindsight, it would have been easier to first plunge cut the full width of the bottom of each groove. This would provide the maximum space for the cutter to form the sides of the groove. A second realization was that my cutter for the sides of the groove had a small chip in it. This caused the finished surface to be rough. The cutter was resharpened on my belt sander and then finished with a stone. It now cuts a nice smooth finish when WD-40 is applied as a cutting fluid.

My machined surfaces came out fairly well. I tested a belt in the grooves and it fits nicely. The roughness you see is on the non-functional surfaces where the original rough cast surface was not machined.

I made an identical second pulley. The first one took 8 hours. This one only took 4 hours to make and did not need emery cloth to smooth the grooves.

Stay Tuned for part 17 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



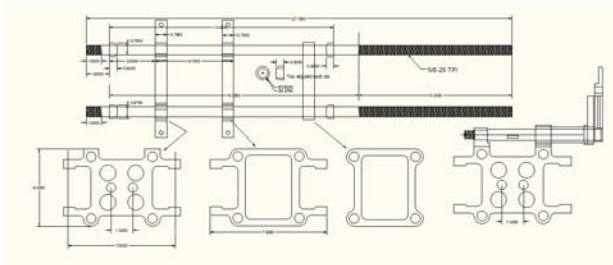
# **Stanley 1906 10 HP Engine Rebuild**

By Rolly Evans

My latest project has been rebuilding a 1906 Stanley engine. The reason for the rebuild is that the engine had been at some time taken apart and re-assembled incorrectly. The cylinder block was upside-down and all the link bars were back end too.

This engine was an early 1906 engine without a hookup dog as was later changed in 1908. The engine I used in building my Stanley EX is of the 1908 style.

I decided if I was going to pull the engine apart I would make a new frame to convert the engine to hookup as well as make the engine frame much stronger as the early engines do a lot of twisting.



I started by doing CAD drawings and designing a new frame, making it from stronger 4140 plate and oversize rod of 3/4" instead of the original 5/8" rod. I used 4340 steel for the rods. The plate drawings were sent over to Apex machine to be water jet cut to shape.



After the plates were cut, I set them up in the mill to finish bore the holes to size and

trim other areas as required. Once the rods were turned and threaded, I made some jigs and set the complete frame together in the welding shop to silver braze it together.



I decided to make new crosshead tracks as this engine uses 1/2" ball crossheads and as part of the frame I would make it all new. I machined up the tracks and sent them out to S&P metallurgy for hardening. When I got them back I set up the surface grinder and grounded them to finish size.



The engine is now complete, tested and running on air.

Rolly Evans

## ***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

## ***NEMES Tee Shirts***

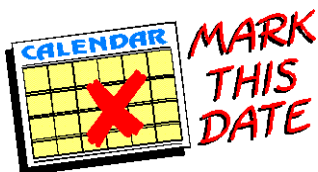
NEMES tee shirts and sweat shirts are available in sizes from S to XXXL. The tee shirts are gray, short sleeve shirt, Hanes 50-50. You won't shrink this shirt! The sweat shirts are the same color, but long sleeve and a crew neck. Also 50-50, but these are by Lee. The sweat shirts are very comfortable!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

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

*Bill*

July 2<sup>nd</sup> Antique Engine Meet & Tractor Pull  
Boothbay Railway Village  
Rt 27 Boothbay ME  
<http://www.railwayvillage.org>

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

July 10<sup>th</sup> Pepperell Show  
RT 111 Pepperell, MA Ken Spalding 978-433-5540

July 17<sup>th</sup> 9AM The Flea at MIT  
Albany Street Garage at the corner of Albany and  
Main Streets in Cambridge  
<http://www.mitflea.com/>

July 29-31<sup>st</sup> Eliot Antique Tractor & Engine Show  
Raitt Homestead Farm, Rt 103  
Eliot ME. Lisa Raitt 207-748-3303  
<http://www.eliotantiquetractorandengine.org/>

Aug 4<sup>th</sup> Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry  
Waltham, MA 781-893-5410

Aug 7<sup>th</sup> Ed Roger's open house  
53 Walnut St. Saugus - 781-233-3847

Aug 6-7<sup>th</sup> Scribner's Mill Show  
Sebago Lake Region near Harrison ME  
207-583-6455  
<http://www.scribnersmill.org/btpt.html>

Aug 13-14<sup>th</sup> Straw Hollow Engine Show  
Boylston, MA - J. A. Resseguie 508-869-2089

Aug 20-21<sup>st</sup> Race of the Century  
The Collings Foundation  
137 Barton Road in Stow, MA  
Cost at gate: \$15 Adults  
[www.collingsfoundation.org/cf\\_OpenHouseEvents11.htm](http://www.collingsfoundation.org/cf_OpenHouseEvents11.htm)

Aug 21<sup>st</sup> 9AM The Flea at MIT  
Albany Street Garage at the corner of Albany and  
Main Streets in Cambridge  
<http://www.mitflea.com/>

Aug 26-28 41<sup>st</sup> Annual Meet  
Waushakum Live Steamers - Holliston MA  
<http://www.waushakumlivesteamers.org/>