

The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

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Editor's Desk

Frank Hills

An Old Friend

Brothers and sisters, we've lost an old friend, Donald Strang. His family has sent the following for us.

Donald Bert Strang, 83, a longtime resident of Harvard, died Tuesday, June 21 at Nashoba Valley Medical Center in Ayer. Don was born in Brooklyn, NY, in 1928, and grew up in Valley Stream and Malverne, Long Island. A 1949 graduate of Cornell University, he was active in the ROTC and was commissioned as a second lieutenant in the U.S. Army Signal Corps. He went on to earn a master's degree in electrical engineering from Northeastern University in 1953, while working at Raytheon's Bedford facility. He was recruited by Sanders Associates in Nashua, NH, where he spent the next three and half decades. Don was a pioneer in the fields of microwave and over-the-horizon radar technology, countermeasure systems, and aerial-sonar submarine detection. He loved to travel, and felt fortunate that his work took him all over the world.

Continued next page.

Next Meeting

Thursday, Aug. 4th, 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.) 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.

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Editor's Desk

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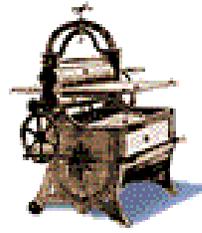
He retired from Sanders in 1988 and acted as an independent consultant for BAE Systems and other firms, but was asked to return the following year, when his expertise and specialized knowledge in radar detection played a crucial role during the first Gulf War.

Don and his wife Irene moved to Harvard in 1956, where he designed and built their house. In addition to being an amateur radio enthusiast, Don was a member of the Institute of Electrical and Electronics Engineers (IEEE). An amateur historian, his interest in the Charles River Museum of Industry and Innovation in Waltham led to his becoming active in the Society of New England Model Engineers (NEME) as well as other regional and national historical and engineering societies. A talented machinist, he enjoying tracking down neglected and cast-off metal milling machines and lathes, which he then restored and used to create custom and small engine projects. In the same way he restored neglected machines to current use, Don's efforts in researching Porter-Allen steam engines led to the 1985 reprinting of inventor Charles Talbot Porter's 1908 memoir *Engineering Reminiscences*. An avid reader, he was a longtime friend and financial patron of the Harvard Public Library.

He is survived by his former wife, Irene, of Shirley, and his two children: Meredith, of Los Angeles, and David, of Gilmanon, NH.

There will be a celebration of his life at the Unitarian Fellowship Building on Sunday, July 24, from 2 to 5 p.m. Private interment will be at Bellevue Cemetery.

Anyone wanting to contact the Strang family may use David Strang's E-mail address (davidstrangmd@yahoo.com) or mailing address (14 Copp Rd. Gilmanon, NH 03237 and tel# 603-267-7646). Donald's phone is still connected but not regularly checked.



NEMES Gazette Editorial Schedule

<u>Issue</u>	<u>closing date for contributions</u>
September 2011	August 19, 2011
October 2011	September 23, 2011
November 2011	October 21, 2011
December 2011	November 18, 2011



President's Corner

Dick Boucher

The Meeting

This month, our youngest member, David Baker, will be discussing his activities with Remotely Operated Vehicles. David will be talking about a set of **ROVs** that he has designed and built, what he has done with them and how you can affordably build one for yourself. **ROVs** have been taken for granted in the oceanographic research and oil drilling industries, are almost unknown to the general public until now. Universities are finally starting to realize that this is the thing of the future so they have started to offer outreach programs teaching simple, inexpensive underwater robotics, causing the technology to slowly but surely leak into a body of water near you.

Miscellaneous Ramblings

I have to note with sadness the passing, after a long illness, of one of our founding members Don Strang. Don was very active in the early days of our society giving many fine presentations on the art of sharpening drills using the four-facet method. Our sincere condolences go to his family.

Last month I made mention that "knowledge is useless unless shared". I give many thanks to Frank Dorian and Rollie Evans for their contributions to the Gazette. My special thanks go to Frank for his article on the dog-leg bevel square. I have had one of these tools in my tool chest since I was an apprentice many years ago and didn't have the

slightest idea why the dog leg. Thanks to Frank's submission to the gazette I not only know what the tool is used for, I also realize how many times I could have used it for various projects over the years.

On July 9th Bea and I started the in Ossipee New Hampshire to enjoy large-scale model railroading up in the mountain / lakes region. The electric locomotive ran very well and I was able to haul some young folks around the track. To be honest, a couple of older folks enjoyed riding as much as the youngsters. We did cut that part of the day short to make tracks for Essex MA, where we met Henry Szostek, Dick Koolish, Howard Gorin and Al Goldberg and witnessed the launching of the schooner Arrabella at Harold Burnham's shipyard. This was a traditional Essex schooner launch as done in the heyday of shipbuilding in Essex.



The ship is built on a framework that extends into the water at high tide. The keel is laid on a series of blocks called dry blocks, that are arraigned securely on the framework and construction commences. The ship is built up to and including the deck. The various final fitting out and stepping of the masts are finished after the ship is in the water.

On the day of the launching, a ramp was built on the port side of the hull to within a couple feet of the hull. The top planks of this ramp were coated with melted paraffin wax. A second waxed board with grease was placed face to face on this ramp and greased blocks are placed at intervals under the keel with wedges under them. The hull at this point was supported by two standard marine hull supports, a very tall building jack on the port side, four marine supports on the starboard side and the dry blocks under the keel. At this point a request

was put out for complete silence in the shipyard and at the shipbuilding museum across the inlet from the ship as the men involved in the launching needed to communicate with each other.

Slowly, Harold loosened the marine supports on the port side and started to lower the building jack while the men on the starboard side started to raise the jack stands. Slowly but surely the entire hull was resting on the previously mentioned ramp and the dry blocks at about a 10-degree list to the port. Now, after the traditional busting of the champagne bottle on the bow of the ship, the entire launch crew moved to the starboard side of the hull and used sledgehammers to drive the wedges under the greased blocks, slowly lifting the entire weight of the ship onto the greased blocks and the ramp.

Slowly the hull started to move toward the Essex River but stopped. More hammering with the wedges produced a bit more progress toward the river but again it stopped. Then Harold used the large jack on the keel at the bow to push the hull further down the ramp for a little more progress toward the river but it was so slow that finally the launch crew actually pushed on the hull and it began to pick up speed as it headed toward the river to a loud applause from the huge gathering. The ship hit the water and sat perfectly aligned with the painted waterline showing how well designed she was.



Some folks have asked me why they didn't just bring in a barge-mounted crane to lift the hull into the water or why after all these years there isn't a marine railway in the shipyard. This is a traditional shipbuilding yard and the launch is done in a traditional manner.

On a different note I have received a file from Jim Johnston on the Bessemer aircraft engine but I have been unable to open it so I will have to talk with Jim about what program he used to create it so we can include it in a later newsletter.

Dick B.



Shop Hints

By Norm Jones

My favorite Mill-Drill accessory is the Digital Readout that I installed quite a number of years ago. Recently I suspected that the readings on one of the scales were incorrect. Upon closer examination I discovered that the mounting hardware on the "X" scale had loosened up. I could have just tightened the screws and "been done with it", but I decided that disassembly and a thorough cleaning of all parts was in order.

The mounting screws, located on the extreme end of each scale, pass through a "U" shaped plastic ear with a clearance hole on the far side to accommodate a screwdriver as shown below.



I got to thinking that the installation of these screws with required flat washers would be a tricky procedure at best. The question was: how to install the hardware without dropping something in the process?

The method that I chose to use involved making a thin cardboard retainer that would hold everything in place while the screws are started.

A punch was fashioned out of a piece of steel rod, turned to a diameter slightly smaller than that of the 4-40 screws. A center drill was used to give me a nice sharp edge to cut the cardboard (cereal box stock). I then used a knife to make a cut between the hole and the edge as shown, allowing for easy removal of the retainer after the job is done.



I am pleased to report that all went well and once again my DRO is working just fine!



Tool Corner

By Frank Dorion

This month's focus is on a set of tools for measuring hole diameters. Brown & Sharpe, Lufkin and Starrett made many tools for hole measurement, but I believe Brown & Sharpe's No. 672 Taper Parallel Gage Set was a unique item for this purpose. I would be very interested to know if anyone has seen a similar set by another tool company.

The set consisted of 10 gages made of high grade tool steel, hardened and ground to very close tolerances. Photo 1 shows the set in its fitted mahogany case.

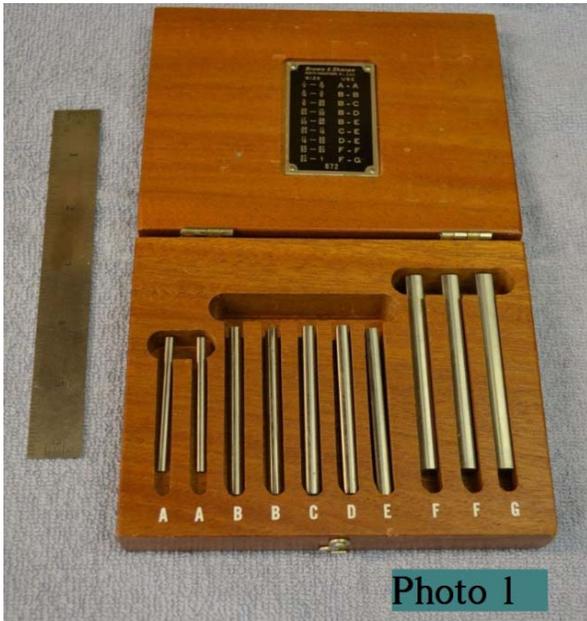


Photo 1

This set will measure any hole size from 1/4" to 1". It was intended to be used as an alternative to plug gages. When you consider that it would take 750 plug gages to cover the same range of diameters, it's easy to see how valuable this little set can be in the shop (That's a 6" rule to the left of the case). In addition, plug gages progress in size by .001" increments whereas the Brown & Sharpe gages, being tapers, are, in theory, infinitely adjustable and should be accurate to at least half a thousandth. The set can also be used instead of plug gages to measure distances between holes (as long as the holes are different sizes).

Each gage is tapered in length with one edge being flat and the other edge ground to a specific radius (see Photo 2).



Photo 2

The two smallest gages are on the slender side, so they were spring tempered to prevent

damage. Since each gage has the same taper, when the flat sides of two of the gages are put together with their tapers opposed, they create an adjustable parallel whose outer edges are radii that will automatically seek the hole's full diameter as the gages are slid lengthwise in opposite directions. Each gage is stamped with a letter code. A table fastened to the inside of the case lid (Photo 3) gives the gage combinations for each range of hole sizes.



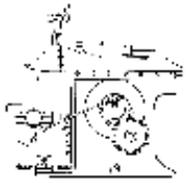
Photo 3

With the gages adjusted to a snug fit in the hole, a micrometer measurement over the pair of gages gives you the hole diameter directly (Photo 4). As an added feature, if your hole happens to be bell-mouthed, the gages will reflect the dimension of the hole's minimum diameter.



Photo 4

Judging solely by my tool-hunting experiences, this set is not common. However, they do turn up from time to time, and when they do, they often go for a fairly modest price because they are unrecognized. The last set I saw on eBay went for less than \$50. To give you a sense of the set's value, Brown & Sharpe's 1952 net price list showed a price of \$29.75 for No. 672. That is equivalent to \$253.68 in 2011 dollars.



Metal Shapers

By Kay Fisher

R. G. Sparber's Gingery Shaper - Part 17

Machining Crank Yoke and Pivot Supports

Gingery intended for the crank yoke to be built from steel bar stock and cast aluminum. The pivot support is also supposed to be cast aluminum. Given my access to a mill/drill and welder, I decided to take a different path.



Crank Complete Photo by R. G. Sparber

I chose to mill the crank yoke out of a slab of steel. The machining of the slot was described in a previous article.

The two holes were first step drilled and then bored out to a press fit for bronze bearings. I chose to use 1" OD, $\frac{3}{4}$ " ID bronze bearings because I had them in hand. The larger diameter should be a good thing on the pivot end since it will be more ridged than the original $\frac{1}{2}$ " bar. The top bearing, shown on the left, presented a minor problem in that I must connect to a $\frac{1}{4}$ -20 bolt. This was solved by making a sleeve with an OD of $\frac{3}{4}$ " and an ID of $\frac{1}{4}$ " as will be shown later.

The slide block was machined from a high density plastic that is commonly used for bearings. The crank pin was made from a standard $\frac{3}{8}$ " diameter bolt with a sleeve added to bring the shank up to $\frac{1}{2}$ " diameter.

Machining Bearing Holes



Marking Bearing Hole Photo by R. G. Sparber

The position of each bearing is not critical. I used my spud and scribed lines to locate each center. A center drill was first used, followed by a $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", and $\frac{5}{8}$ " drill.



Boring Bearing Hole Photo by R. G. Sparber

With the hole at $\frac{5}{8}$ " diameter, I was able to bring down my boring head and open the hole out to 0.998". It takes a bit of care to be consistent on those last three equal depth passes, but I did get within 0.001".

Note that I am using soft jaws and the yoke is securely held with only about 0.1" of contact.

The bronze bearings were pressed into the holes using my bench vise. A block of pine and a strip of $\frac{1}{8}$ " extruded aluminum scrap protected the crank yoke and bearing.



Cutting Pivot

Photo by R. G. Sparber

I cut a 3.1" length of 3/4" CRS to be used as the pivot. Note the slab of paraffin wax flanking the round stock. As the saw cuts the wax, it carries it into the cut. Bits of metal, coated with wax, fall out the other end and the cut has a nice finish.



Crank Pin Sleeve

Photo by R. G. Sparber

The crank pin is supposed to be a shoulder bolt but I didn't have one in my junk drawer. So instead I made a sleeve. The ID was step drilled to a size U and then I ran a tap to permit the rolled threads of the bolt to pass. I only had to cut in a few thou but chose this route rather than going with a looser fit between sleeve and bolt.



Lapping for Fit Photo by R. G. Sparber

After deburring, the length of CRS was put in my 3-jaw chuck on my lathe. The ends were trued up and the overall length reduced to 3".

Next I wanted to get a good sliding fit between the bar and the bearing. Clovis 600-grit lapping compound was smeared on one end of the bar. I then ran it through the bearing with the drill chuck for support. Once done, I used plenty of cleaner to flush the grit from the bearing.



Plastic Slide Block

Photo by R. G. Sparber

The slide block was very easy to machine. This plastic cuts like wax although it does tend to melt when shaped on the belt sander. The sleeve is hidden inside the slide block. As part of the final assembly of the crank pin, I must cut the thread to fit.

Using this plastic is a minor gamble. If it is unable to survive the jarring forces of the ram, I will make a new one from bronze.

Stay Tuned for the second half of part 17 from R. G. Sparber next month.

Keep sending me email with questions and interesting shaper stories. My email address is:

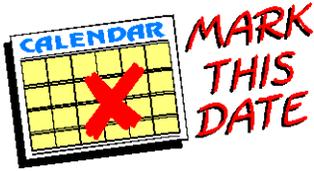
KayPatFisher@gmail.com

Kay

Lathe for sale!

Logan 9" lathe with change gears, two faceplates, 3-jaw and 4-jaw chuck, steady rest, set of dogs, pan, legs, AXA-size tool post and more. The lathe is coated with guk from a house fire, so needs cleaning and motor. The flat belt is now melted. S/N 8300. \$200 firm.

Jim Hansen 603-487-2115, New Boston, NH.



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

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

Aug 7th Ed Roger's Open House
53 Walnut St. Saugus MA
781-233-3847

Aug 6-7th Scribner's Mill Show
Sebago Lake Region near Harrison ME
207-583-6455

Aug 13-14th Straw Hollow Engine Show
Boylston, MA
Contact J. A. Resseguie 508-869-2089

Aug 20-21st Race of the Century
The Collings Foundation
137 Barton Road in Stow, MA
Cost at gate: \$15 Adults
collingsfoundation.org/cf_OpenHouseEvents11.htm

Aug 21st 9:00am The Flea at MIT
Albany Street Garage at the corner of Albany and
Main Streets in Cambridge
<http://www.mitflea.com/>

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

Sept 1st Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry
Waltham, MA 781-893-5410
<http://www.neme-s.org>

Sept 2-4 Vermont Gas & Steam Engine Assoc Show
Intersection Rte 100 and Rte 107 Stockbridge VT
Contact Gail Norman 802-485-8224
gailnorman@trans-video.net

Sept 10th NEMES booth at Saugus Iron works
<http://saugusironworks.com/>

Sept 10-11th Dublin Show
RT 101, Dublin, NH

Sept 10-18th Annual Lee's Mills Steamboat Meet
Lake Winnepesaukee Lees Mills NH
<http://www.steamboating.org/>

Sept 16-18th Fall Meet
Pioneer Valley Live Steamers
Southwick MA.
<http://www.pioneervalleylivesteamers.org>

Sept 18th 9:00am The Flea at MIT
Albany Street Garage at the corner of Albany and
Main Streets in Cambridge
<http://www.mitflea.com/>

Sept 24 Vermont Gas & Steam Engine Association
Fall Festival - East Burke, VT
Contact Gail Norman 802-485-8224
gailnorman@trans-video.net

Sept 23-25 Connecticut Antique Machinery Museum
Fall Festival
<http://www.ctamachinery.com/>