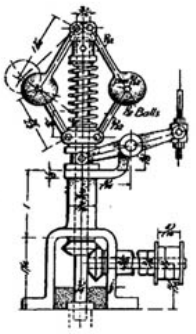

The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 174 Oct. 2010

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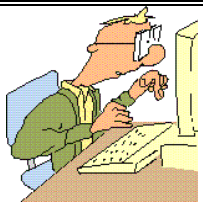


Editor's Desk

Frank Hills

From Here to the Moon!

There is just something about technology and science fiction. Few are the people I know who like keeping pace with technology but don't like writers like Jules Verne. My favorite story, "From Here to the Moon". A giant cannon shell is designed and built as a space capsule to carry men to the moon. Well, that was the idea, anyway. Jules didn't know very much about physics. Had it actually been tried, the entire crew would have been homo-mush by the end of the barrel. But that didn't ruin the excitement of the story, did it?

Believe it or not, there have been serious attempts to put cannon launched projectiles into space, and with limited success! The Germans did it accidentally while trying to bombard Paris from a safe distance away…during WWI. The first gun, called the Kaiser Wilhelm II, was a modified battleship gun. Originally 15 inches in diameter, it had an insert that reduced the size to 8.26 inches. It was only good for 65 shots because each time it was fired, bore wear increased the size of the next shell needed.

–Continued on page 2

Next Meeting

Thursday, Oct, 7 2010

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

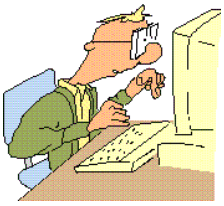
Membership Info

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

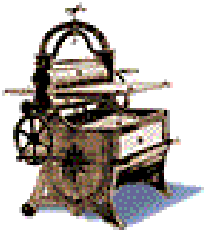
-continued from page 1

Increasingly larger shells had to be fired in order for the system to work. The maximum altitude reached. 40km. That record stood until the V2. The shells spent so long in flight that the rotation of the earth had to be considered when aiming the beast. After the war the allies experimented with the only surviving gun. They fired a shell from the French coast and hit Kent, England. Despite this overwhelming technical feat, the gun was useless as a weapon. You couldn't really say you were aiming at anything in particular. You just "hit something near Paris". The Germans tried again during WWII, but with little more success.

During the 1960s, a Canadian man named Gerald Bull rediscovered the idea and convinced the US government and McGill University to fund experiments into launching satellites using the same technique. The project was called HARP (High Altitude Research program). Again, success! Repeated firings managed altitudes of 6.6 km. That's about 215,000 ft. Eventually, some simple electronic packages were designed which could survive the incredible acceleration. But the program had its limitations and was eventually dropped.

Gerald Bull did continue to find additional funding here and there, and he did accomplish more than anyone else, building dart shaped projectiles with somewhat usable payloads and improving control of the trajectory. Rocket science it wasn't, and rockets took over. But that's not the end of the story. Bull went on to drastically improve high-power artillery, its accuracy and range, and he devised ways to reduce recoil and barrel wear. He could, in fact, be called the father of modern, high tech artillery. But you're not likely to hear his name used favorably now-days. His last job was for Saddam Hussein. He was building a huge, smooth-bore gun to take a 3000 lb shell. The Iraqis claimed it was for scientific use. The CIA claimed it was aimed at Israel. Anyway, it was dismantled and parts of it are in museums. It was never fired. Bull was assassinated outside his apartment in Brussels in 1990. It was never determined by whom, but his willingness to work for anyone willing to pay his way made him many enemies.

Next month "Ceramics".



NEMES Gazette Editorial Schedule

Issue	closing date for contributions
Nov. '10	October 22, 2010
Dec. '10	November 19, 2010
Jan. '11	December 24, 2010

Past President's Corner

Dick Boucher

The Meeting

Our speaker for this month will be our own Norm Jones. Norm will be discussing various machining techniques that he has used building model engines. The Stirling-cycle engine project that was published in the Dec 2007 and Jan 2008 issues of the NEMES Gazette will be used as a reference for this talk.

Miscellaneous Ramblings

Well the fall activities are in full swing here in New England. It seems every weekend, one has to decide between a number of hobby related activities. Last weekend there was the choice of the Pioneer Valley Live Steam Club fall meet and a Northeast Live Steamer meet in Walderboro Maine, the steamboat meet at Lee's Mills on Lake Winnipesaukee, or the Steam weekend at Clark's

Trading Post / White Mountain Central Railroad in Lincoln New Hampshire. Bea and I chose the White Mountain Central Railroad as we have for many years now.

I headed up there on Thursday morning to help get the locomotives ready for the weekend. All of them need a safety check and a good exterior cleaning before the show can begin. This year, we were short two locomotives as the Heisler is undergoing extensive boiler repair and the Climax has a broken crankshaft. The crankshaft isn't a major problem but when the locomotive was disassembled it was discovered that the skew bevel gears should be replaced. There was a day when these parts could be ordered off the shelf but today they will have to be manufactured and as such there is a quest to find a suitable vendor to produce them.

The rest of the fall season of interesting functions is still in full swing with many activities yet to be held. Two of interest to our Society would be the Yankee Steam-Up at the New England Wireless & Steam Museum, 1300 Frenchtown Road East Greenwich RI 02818-1309.This is a great show with a very large steam table (60 foot) filed with great models. The next day is Rolly Gaucher's gathering at his shop in Spencer Massachusetts…another great gathering of members of our society. There is always a lot of discussion going on in the shop and always a great selection of potluck food. So if you are free and are so inclined, bring along some food to share and enjoy a great afternoon of shooting the bull and learning how other fellows have solved problems in their model building activities. I have not mentioned everything that is coming up so check out Bill Bracket's great column of coming events in every issue of the Gazette and come out and join other members at some of the activities.

I want to Thank Norm and Victor for providing the speaker for this month's meeting and for having booked speakers through December. This committee will be a great asset to the next president and is open to more help from members.

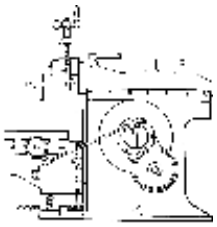
Last but not least Norm, Rich Baker and I are starting to plan the bus trip to the Cabin Fever Exhibition in York. Amazing how the year has passed so fast. So keep the bus trip in mind and remember our own show in February.

Dick B.

Speaker Selection Committee

I would like to thank Victor Kozakevich for volunteering to work with me to find speakers that would be of interest to our organization. There is no requirement to serve formally in this capacity. I spoke with a number of our members about this subject at our last meeting. I encourage each and every member to participate in this process. NEMES members are also encouraged to consider doing a presentation as well. I can be reached at: (978) 256-9268 or nejhome@yahoo.com. Thank you in advance for your support.

Norm Jones



Metal Shapers

By Kay Fisher

R. G. Sparber's Gingery Shaper - Part 7

Machining the Ram and Cap

Next I attached the cap to the ram body and cleaned up the sides of the unit.

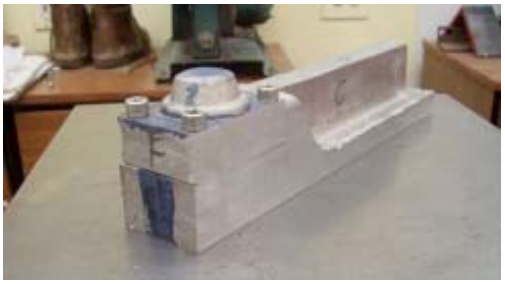
Cap on Ram Photo by R. G. Sparber

The cap was fitted to the ram and clamped down. I am again using machined pads to insure that the ram casting is parallel to the X axis and to the table top. I have placed a 0.02" aluminum shim between the cap and ram

body. After I drill and bore out the pivot hole, this spacer will be replaced with smaller shims to provide a sliding fit on the pivot bar.

Cap Bolted to Ram Photo by R. G. Sparber

Drilling and tapping the 4 holes was nothing special. I then remachined the sides so the cap would be the same width as the ram. The above photo shows a little shrink blemish in the ram cap.



Cap & Ram Photo by R. G. Sparber

This side looks a lot nicer. The next step is to mount the unit on my lathe.

Boring Ram and Cap

This task is the culmination of a lot of planning and a lot of listening to others. The task at hand is to precisely bore the pivot hole in the end of the casting. This hole must have a centerline that is parallel to the bottom and side of the ram. Additionally, the front end of the casting must be cut perpendicular to this bore.

The only machine I have that can handle this task is my lathe.

The casting has a precisely cut bottom and perpendicular sides. They will be used to align the casting before I bore the hole.

Ram on Compound Slide Photo by R. G. Sparber

Taking advice from numerous sources including Home Shop Machinist articles and people in the Yahoo group Gingery_machines, I decided to mount the casting on my compound. All of the machining will be in the front 3” so that is what was clamped to the compound. I found the vertical centerline of the casting and marked it. Shims were then used to raise the casting so the live center was reasonably close to this line. It is not essential that the center of the bore be exactly at the center of the casting.

In the above picture, the live center seems to be well below the casting's centerline. This illusion is because of the position of the camera.

Aligning Ram with Lathe Photo by R. G. Sparber

Here is the one semi-original step that I can claim for myself. How do I accurately and easily pivot the casting on the compound so its bottom (oriented vertically) is parallel to the spindle's centerline? I took a length of straight 1” drill rod and put it into my 3 jaw chuck with about 10” of overhang. Then I pivoted the compound and feed it in the crossfeed until there was a snug fit between casting bottom and the rod. I am using a 1-2-3 block

as my spacer so my reference bar does not hit any of the hold down bolts.

Alignment with V Blocks Photo by R. G. Sparber

I was not confident that I had the best fit so changed to a set of V blocks. It was then easier to see when the casting was aligned with the bar. The C-clamp is lightly gripping the rod on the first V block and I was then able to better feel how well the second V block fit.

Testing Alignment Photo by R. G. Sparber

I was confident the casting's base was parallel to the spindle's centerline but still wanted to test it with my DTI. I am actually testing that the casting is parallel to the ways here but that is close enough. I moved the saddle along the ways and noted deflection on the DTI. Surface roughness moved the needle ±0.0005" but there was no trend to indicate misalignment.

Testing for Level Photo by R. G. Sparber

I wish I could tell you that I tested the casting for level as my next step. Instead, I started drilling out the hole and then realized that I forgot to do this test. Fortunately, it showed the casting was within 0.001" for the entire side (facing up) of the casting.

Aligning Cross Slide Photo by R. G. Sparber

The next step was to position the cross slide so the centerline of the spindle is at the casting centerline. I used a spud in my 3 jaw chuck. This is not a critical position but I do want the bore to be half in the body and half in the cap. I then set the cross feed dial to zero just in case I bumped it.

Center Drill Photo by R. G. Sparber

The center drill went into the 3 jaw chuck first. I then drilled in 2.9" with a ¼" drill. This was followed by a $^{3}/_{8}$", ½", and $^{5}/_{8}$" drill.

1/4" Drill Photo by R. G. Sparber

There is nothing very exciting here. I just did not want to stress the casting's fixture too much by going from a ¼" hole right into a $^{5}/_{8}$" hole.

5/8" Drill Photo by R. G. Sparber

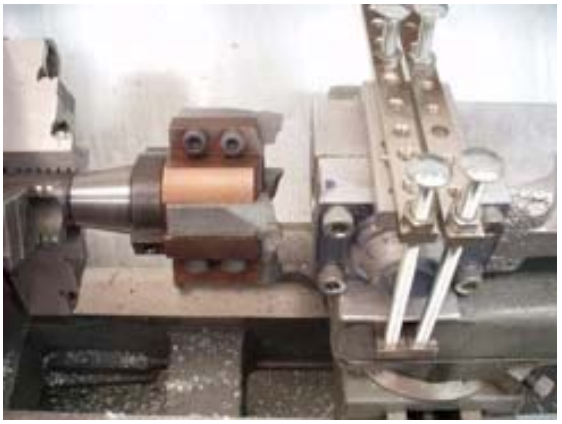
Boring Hole Photo by R. G. Sparber

The hole is now large enough to take my boring bar. This boring head normally runs in my mill/drill but works fine here. The thing to remember is that the head gets advanced to increase the hole's diameter, not the cross feed.

This cutter has a carbide brazed insert. I ran at about 1100 RPM at first and had a lot of chatter so dropped to 800 RPM. That stopped most of the chatter.

Boring to 3/4" Photo by R. G. Sparber

It did not take long to open the hole out to 0.750" diameter but the surface finish was poor. Rather than spoil the precise diameter, I decided to sand the bore a little when done.



Facing Photo by R. G. Sparber

Next, I mounted my shell mill on the 3 jaw chuck and changed to 2072 RPM. Note that the boring and this facing operation were done without disturbing the orientation of the casting. This gives me the best chance of having the bore's centerline perpendicular to the front face.

Facing Finished Photo by R. G. Sparber

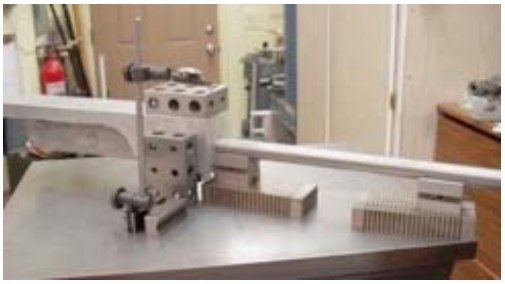
The facing operation was quick and easy. In the photo above, it looks like there is a problem with

the surface of the casting here but it is just an artifact of the lighting.

Ram & Cap Separated Photo by R. G. Sparber

You can see some of the poor bore finish in this picture. There was a fair amount of chatter and gouging. Although not pretty, it is not serious. I wrapped some 220 grit emery cloth around a 1/2" rod and took off the high points. I would rather have this rough surface than risk reboring the hole and going oversize.

You can see the 0.020" shim on the body half of this bore. I used aluminum for this shim rather than stainless, to avoid disrupting the machining.



Testing Alignment Photo by R. G. Sparber

The next step is potentially painful: evaluating how the bore came out. I took a length of ¾" drill rod and clamped it into the bore. The rod is on my V blocks such that the rod is supporting the casting. A 1-2-3 block flanks the casting to insure that the bottom face (oriented to be on top), is parallel to the surface plate. A second 1-2-3 block has been placed on the reference surface so the DTI does not see any roughness. As I swept the DTI longitudinally along the block, I saw no deflection of the needle. I then swept the DTI transversely (perpendicular to the rod) to verify the surface was indeed parallel to the surface plate.

The casting was then rotated 90° to verify that the bore is parallel to the side of the ram. I again moved both transversely and longitudinally. Needle deflect was less than ±0.0005".

I would say that getting this much accuracy is 50% planning and careful work. The other 50% is dumb luck.

Bore Completed Photo by R. G. Sparber

The next and final step on this part is to attach the steel plate that will support the ram.

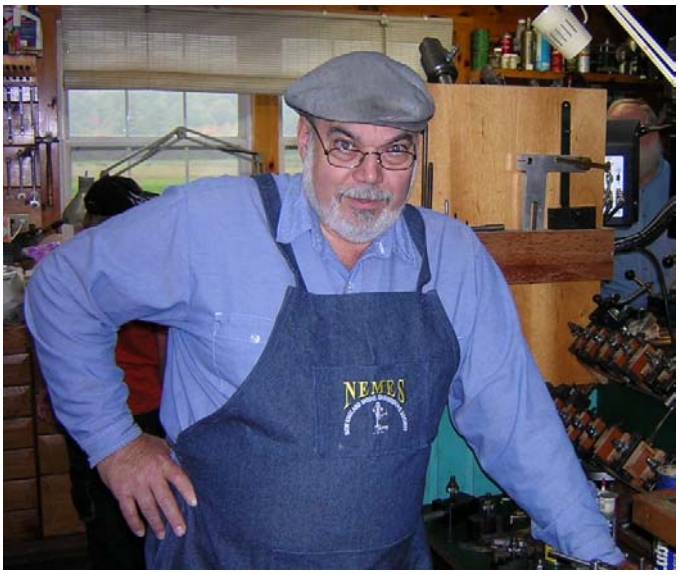
Stay Tuned for part 8 from R. G. Sparber next month. Keep sending me email with questions and interesting shaper stories.

My email address is:

KayPatFisher@gmail.com

Kay

NEMES 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!

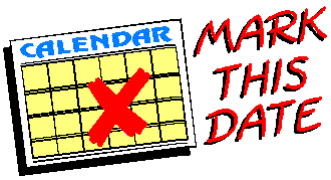
Artwork by Richard Sabol, printed on front and back:

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
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

Oct 2nd 8AM-4PM Original Yankee Steam-Up
The New England Wireless and Steam Museum
1300 Frenchtown Road East Greenwich, RI
http://www.newsm.org/index.html

Oct 3rd 12:00-5:00
Roland's Shop visit
90 S. Spencer Rd. Spencer MA
508-887-2277

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

Oct 9th CMSG&MA Swap meet
Orange Airport Orange MA
Grover Ballou at 413-253-9574

Oct 9 - 10th 8:30 to 4:30 Battle for the Airfield
The Collings Foundation
137 Barton Road in Stow, MA
Cost at gate: $20 Adults
http://www.collingsfoundation.org/cf_battle2010.htm

Oct 9-10th Foreign Auto Festival & Antique Aeroplane Show
Owls Head Transportation Museum Owls ME
http://www.ohtm.org/

Oct 17th 9:00am The Flea at MIT
Albany Street Garage at the corner of Albany and Main Streets in Cambridge MA
http://www.mitflea.com/

October 30th 9-5 American Precision Museum
10th annual Model Engineering Show
Windsor Community Center, Windsor VT
www.americanprecision.org 802-674-5781.

Oct 30-31th The Great Fall Auction
Owls Head Transportation Museum Owls ME
http://www.ohtm.org/

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

Nov 5-7th World Championship Punkin Chunkin
East of Bridgeville, Delaware
http://www.worldchampionshippunkinchunkin.com/