



The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

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Editor's Desk

Frank Hills

The Changing Image of Power.

I love museums. One of my favorites is Mystic Seaport in Connecticut. They have ships from three different centuries just waiting for you to climb aboard. I love the ships, but they aren't what fascinate me most about the place. It's the evolving engine technology represented there. They have the 1841 whaler Charles W. Morgan with one of the first gas powered winches. The winch was added sometime around the turn of the century. That winch weights 500 lbs and produces 5 horsepower. That was a big deal back then. It replaced eight men on a windlass who took far longer to do the same job. The modern equivalent for that engine weighs 35 lbs. They've also restored a few steam engines and early diesels. I was lucky enough to be on hand for the first test firing of an 800 horsepower compound steam engine fresh from rebuild. It was amazing, surprisingly quiet, and dangerous looking with its five foot long connecting rods and drive shaft the size of a telephone pole all whirling around at an astounding 250 RPM.

-Continued on page 2

Next Meeting

Thursday, April 1, 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.

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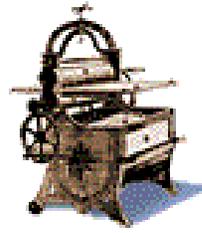
Editor's Desk

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Three cylinders chugged away for only about two minutes before they had to shut it down. It had used up a one hundred pound bottle of propane heating the water. This beautifully restored monster was two stories tall. Its diesel replacement (the ship it came from was upgraded in the 1930s) was less than half the size. Today you can buy a six-person sport boat with the same horsepower. They use modified car engines. Obviously times have changed.

It's the way we look at power that dictates where we go with the technology. Technology inspires improvement, but even the concepts of improvement change over time. "Bigger is better" used to be the mantra, not only for the power an engine could produce, but also in terms of reliability. Material science wasn't as developed as the machines being built until the industrial revolution. Especially in metal, making something bigger was also safer. Then Bessemer built his oxygen furnace and over-sizing was no longer necessary. Fuel economy was an issue only as far as an engine could be depended upon to get from point A to point B, until the cost of fuel began to go up. Then efficiency became a prime issue. As time progressed other needs became important. New engine technologies became available. A large steam engine took up cargo space. The diesel took up less. In the field of aeronautics, reliability took precedence over everything else, and still does. But with the advent of the modern jet engine with its 0.1% incident rate, you can now fly from New York to Berlin direct in a jet with only two engines. Only 10 years ago, safety regulations require four engines and one hour to farthest landing strip for such a flight (Air and Space Magazine; April 2010). Yes things have changed. But where are they going now?

Next month..."Little Machine Tools"



NEMES Gazette Editorial Schedule

<u>Issue</u>	<u>closing date for contributions</u>
Apl. '10	Mar. 22, 2010
May '10	Apl. 20, 2010
June '10	May 25, 2010



President's Corner

Dick Boucher

The Meeting

Our speaker this month is John Goodman. John is the fellow who had the Annosphere at our show in February along with the internal ring gear cutter and gear cutter he built to make the gears for this instrument.

John got interested in building clocks when he was in high school. He recently discovered that a simple combination of four gears could produce a gear ratio of 365.2422 to 1, enabling a clock to include a yearly cycle along with a daily cycle.

To build this clock, which he dubbed an Annosphere, he first needed to make gears; to make the gears, he needed to build a gear cutter. Building a prototype showed him why he needed to build a second gear cutter. As is often the case, the tools are often as interesting as the final product.

He'll be showing these tools and explaining the design process and the construction techniques of the Annosphere, supplemented with animated illustrations of the gear ratio mechanism.

Miscellaneous Ramblings

It has been an exciting month since I last wrote this column. First, it was the heavy windstorm leaving many of us with no power for some time. I was talking with a fellow who works for National Grid and every tree through a power line he encountered was a pine tree. Most of the damage from that storm was in the North Shore area but it sure was exciting that night.



Turning Ram Cone Photo by R. G. Sparber

It made a mess of my lathe and shop, but I turned a very nice looking cone. The hole in the side of the cone is from pilot holes for wood screws that hold the wood to the faceplate.



Half Ram Cone Photo by R. G. Sparber

I then used a handsaw to cut the cone in half. This was followed by cutting out the sectors shown in the drawing. In the end my gluing job was poor and bit of wood fell off. That was easy to fix but the resulting sectors just did not look so good. Not much learned on this one but I'm glad I did not use these side lobes.

I then decided to take a much simpler approach. Two squares of 3/4" MDF were cut to fit the sides of the ram. I then used a straight edge and compass to draw the two transitions. Rough cutting was done on the bandsaw. I then sanded to the line on a belt sander. The sides were beveled by eye.

After gluing up, wood putty was used for fillets.



Ram Spine Photo by R. G. Sparber

The spine of the ram is taller than specified by Gingery, as are the transition pieces. This was done to better support the top cap.

Except for making it longer by 3", this is the same as Gingery's design. At first I used his trick with waxed paper to form the fillets but they came out with a ragged edge. I then read in my U.S. Navy Foundry Book that a fillet with a right triangle cross section was better than a curved fillet. So I cut a few sticks of MDF to form the fillets. They worked very well. I still used wood putty to blend the transition between MDF fillet and vertical surfaces.



Front Column Pattern Photo by R. G. Sparber

The problems started when it came to ramming up this pattern. I used the same flask as used for the side column plates. Two bars were placed across the cope to hold gagers and I rammed the cope very hard. The cope dropped out soon after I cut the sprue. Fortunately the drag was spared. Here are the lessons I learned:

Once the cope is lifted from the drag, keep the two parts far away from each other so a failure of the cope does not damage the drag.

Do not pull the drag pattern parts until you are sure the cope is solid, since you may have to re-ram the cope.

If you are ramming the pattern at the same time you are melting the aluminum, be sure to have a "plan B" so you can dump the melt when it is ready.

My second try at ramming the front column plate was not good. By the time I was ready for the pour, it was dark out and I was tired from a day of turning scrap aluminum into ingots. So I left the drag on its bottom board and put my molding board on the bottom of the cope. Then I rotated the cope so it was horizontal.

In the morning I fired up the furnace and carefully moved the drag to the pouring area. Then I

moved the cope. As I lifted the cope from the molding board, there was a thud – I had a major drop out. So it was back to the sandbox.

This time I placed the pattern in the drag at a diagonal. My hope was that the ends would be closer to the flask walls so be less likely to fail. I then rammed the sand much harder and used a 1/4" x 1" x 5" steel bar to ram around the pattern. My riser was placed near the end of the pattern that would become the top end of the part.

I carefully moved the drag to the pouring area and then the cope. All went well. Then I lowered the cope onto the drag and discovered that one of the guide pins was slightly out of alignment. The little bump caused by this misalignment was enough to cause my third drop out. It was not as massive as the first two and I figured I had nothing to loose so went ahead with the pour.

I was fairly sure the casting would be spoiled but figured I might learn something from the experience.

Here you see the sprue and gate next to their pattern. They worked well. My goal was to have a nice even flow into the casting. The downward force of the aluminum falling down the sprue was absorbed by the void below the sprue. The extra wide gate slows the flow while distributing it across the casting impression.

I put lots of labels on my patterns. They prevented really stupid mistakes.



Fault Line Photo by R. G. Sparber

Here you see the fault line in the cope. Lots of sand fell down to provide more room for aluminum. If this was the extent of the damage, I could have milled it out.

Here are the lessons I learned this time:

Don't give up! Well, I actually knew this lesson but it is good to know when to take a break.

The riser was too close to the pattern which left pieces of cope that were too narrow to support themselves; I will try pencil risers resting on top of the cope pattern next time.

It was worth doing the pour because I can see that if there had not been drop out, it would have been a good part.

Stay Tuned for part 3 from R. G. Sparber next month.

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

KayPatFisher@gmail.com

Kay



Voids Photo by R. G. Sparber

All of these voids had sand in them. I did not see any porosity. Note the areas that were not spoiled. They are nice and square. The on the left end is part of my riser system. I think it was part of my problem in that it unduly weakened the cope.



Sprue Gate & Pattern Photo by R. G. Sparber



The NEMES Show

Early on the third Saturday in February, walking towards the Charles River Museum of Industry (CRMI) over the footbridge crossing the Charles River in Waltham MA, I thought back to the day in March 1994 when the Museum put on its second 'Steamfest'. Howard Gorin's steamroller was running in the parking lot, steam launches were parading on the river and there were exhibits of model steam engines in front of the Museum. Ron Ginger came that day. He was the leader of a small coterie of home shop machinists who had been going to model engineering shows here and in England. He wondered why there were no local model clubs and decided to start the ball rolling.

A meeting with Karen LeBlanc, then Museum Director led to collaboration between the Museum and a yet-to-be-formed model engineering club. The new club, the New England Model Engineering Society, (NEMES) was born that April and is now 15 years old. The alliance has been mutually beneficial; the Museum provides a venue for our club meetings on the first Thursday of the month, and NEMES provided volunteers for the 'Oil Can' gang that set up the late 18th Century machine shop and run an annual model fund-raising show. This year's show (our 14th) attracted over 50 exhibitors and more than 600 paying visitors (not counting dozens of tiny tots who get in free).

NEMES members and exhibitors come from all over New England – from Boothbay Harbor in Maine to Hartford in Connecticut, from New Hampshire, and way west, beyond Worcester in Massachusetts. One couple, Eileen and Jim Volkening, set out from New Jersey at 1:30 AM the night before and drove 350 miles to be here at opening time.

Important as this show is to us, it is not our only public appearance. The NEMES banner is seen at Cabin Fever with a bus-load of exhibitors, at NAMES (only a van-load), the Precision Museum show in Vermont, the North Shore Antique Car Club in Topsfield and a host

of engine shows all over New England. Norm Jones also proudly flies our flag every year at the Rough-and-Tumble show in Kinzer, PA.

CRMI is a particularly appropriate place for a model engineering show. This is where the industrial revolution began in the young United States, in 1813, when Francis Cabot Lowell hired Paul Moody to convert a hand loom into a power loom, raised capital by selling stock, and started the Boston Manufacturing Company in an old paper mill on the Charles River. This was the first mill in the world that did carding, spinning and weaving in the same building, and the first to be organized as a modern factory.

The area downstairs, under the tall smokestack is where a row of six boilers stood, installed when the power from the waterwheel was no longer adequate for the expanded mill. The boilers raised steam for a brace of big engines upstairs in the (now) Jackson room, which houses the main show. They are, alas, long gone.

Meandering from exhibits on the first floor to the main event in the Jackson Room, visitors could browse the permanent collection of clocks, watches, and watch-making machinery from the Waltham Watch Company which revolutionized the production of small precision parts. Then they could go to Ed Ferguson's exhibit and see beautiful models of an eighteenth century watchmaker's gear-cutter and the lantern pinion engine that he brought from Deering, NH.

Many visitors wrinkled their noses when Ed Rogers and Herb Cottrell started up their I.C. engines, but crowds formed around Rollie Gaucher when he revved up his half-scale model of the WWI Bentley Rotary engine. Compressed air powered a large number of other engines. David Oshier's brass elbow engine fascinated many guests.

Henry Szostek brought in the air pistol he is developing. In a conventional air pistol, the pressure drops almost as soon as the pellet starts moving, wasting its energy. Henry's design features an unusual double piston arrangement that keeps the pressure up and transfers almost all of its energy to the projectile.

While I was looking at the 3D printer demonstrated by our youngest member David Baker, I was joined by Walt Winship. In his 90s Walt is our oldest member. He tells me that he is building a new boiler for one of his two steam-driven cars.

Frank Dorion's exquisite center-wheel plow plane reigned as the queen of the show. In addition to the plane, Frank brought a selection of regular wooden

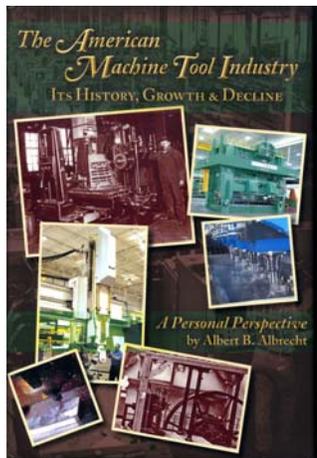
planes, finished and unfinished, together with the kit of his own special plane-makers tools.

Dave Perrault brought a 1/4-scale Brice engine and his brother Richard brought a 1/4-scale Hercules drag saw.

David Bono found a picture of the first detachable outboard motor made by American Motors in 1896. There are no known survivors. David knew the bore and the stroke and, by scaling the picture, gathered enough information to start making a replica. Although it is not finished yet, it is an impressive piece of work, built to David's usual high standards.

Our magnificent Ladies Auxiliary (Sue Brackett, Romaine Bono, Bea Boucher, Leslie Jones and Gale Martha) did us proud as usual, providing sustenance and delicious confections. Once again, they raised more than enough to pay for the rental of the tables. Our gratitude is unbounded.

Max ben-Aaron



Book Review

Ed Ferguson sent me a note about a new book that would be very interesting to any of us who are interested in old iron and the state of the US machine tool industry. The book is "The American Machine Tool Industry" by Albert Albrecht, ISBN 596720336-2. Albert has worked for Kennametal, Monarch, Textron, been in the machine tool industry for 57 years and comes from a family of machine tool makers. His book includes the history of the American machine tool industry starting in the early 1800s and working up to the present. Included are over 100 beautiful photos of vintage and contemporary machinery and the history of the companies behind them. The author also shares many personal experiences

and his perspective on why the US machine tool industry is in trouble.

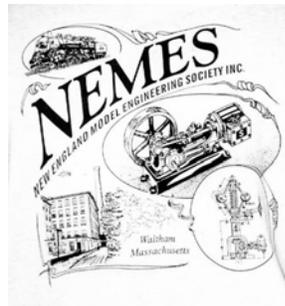
This reviewer bought a copy for himself. Even though this is not yet mass marketed, it is a beautiful, professionally made and bound hard-cover book. Many of the earlier photos are B&W, but there are color photos later on. This book is an enjoyable read and helpful to anyone interested in the history of American industry.

The book is not yet available from the big-name book sellers, but you can buy it directly from Mr. Albrecht for \$42 plus \$6 for postage. Mr. Albrecht will give you a 10% discount if you tell him that Ed Ferguson recommended the book to you.

Albert B. Albrecht
3190 Toddsbury Lane
Richmond Indiana 47374
(765) 962-4903

Thank you Ed!

Bob Neidorff

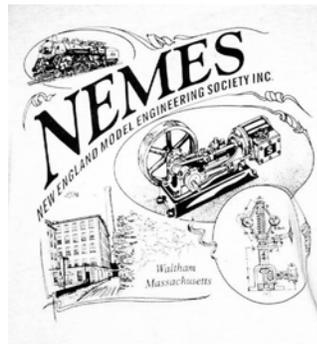


NEMES clothing

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:



Rear



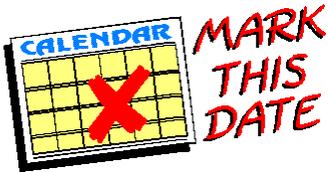
Front

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

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

April 17th – 19th NAMES Expo
 Toldeo, OH
www.modelengineeringsoc.com

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

May 10th
 Connecticut Antique Machinery Museum
 Spring Power Up
 Kent Ct. John Pawlowski President
 P.O. Box 1467, New Milford, CT 06776
<http://www.ctamachinery.com/SpringPowerUP.html>

May 2nd NHPOTP engine show
 RT 113 Dunstable MA
 Robt Wilkie 207-748-1092

May 6th Thursday 7PM
 NEMES Monthly club meeting
 Charles River Museum of Industry
 Waltham, MA 781-893-5410
<http://www.neme-s.org>

May 16th Spring Steam-up
 Waushakum Live Steamers
 Holliston MA
<http://www.freewebs.com/waushakum>

May 16th 9:00am The Flea at MIT
Albany Street Garage at the corner of Albany and Main Streets in Cambridge
<http://www.mitflea.com>

May 25-27th 9:00-5:00
 EASTEC at Eastern States Expo
 West Springfield MA
 800-733-4763
<http://www.sme.org/eastec>

May 29-30th Bernardston Show
 Rt 10 off Rt 91 Bernardston, MA
 Vickie Ovitt 413-648-5215

May 29th American Precision Museum opens
<http://www.americanprecision.org/>

May 29-30th
 Truck, Auto & Antique Aeroplane Show
 Owls Head Transportation Museum Owls ME
<http://www.ohtm.org/>