



# The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 159

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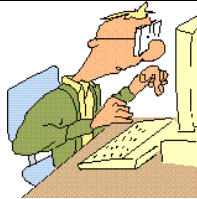
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## Editor's Desk

Frank Hills

### Specialty Machining Techniques.

We at NEMES have a very diverse group. Some of us work in offices and have no machines of our own, others have remarkably complete shops. Of course, no one has everything, or would even want everything. OK, some of us want everything we can get our hands on, whether we know how to use it or not. We'll eventually figure it out and become the club experts. But no matter how much equipment we have or how experienced we are with it, there's always going to be something new. What's even more amazing is how fast these "new" machines become old, and how fast the technology, if not the machines themselves, become available to the hobbyist! It's my job to know about these things and even I can barely keep up with them. This month I'm going to describe a few of these specialty machining techniques now in use by "in" hobbyists.

First off, EDM, electrical-discharge machining. This device uses sparks to blast little craters in conductive or semi-conductive metals to cut and drill.

—Continued on page 2

## Next Meeting

Thursday, July 2, 2009

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

## Membership Info

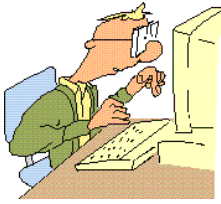
New members welcome! Annual dues are \$25 (mail applications and/or dues checks, made payable to "NEMES", to our Treasurer Richard Koolish, see right) Annual dues are for the calendar year and are due by December 31<sup>st</sup> of the prior year (or with application).

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

Addresses are in the left column.

## Contents

Editor's Desk.....	1
NEMES Gazette Editorial Schedule .....	3
President's Corner.....	3
For Sale.....	7
NEMES clothing .....	7
Upcoming Events.....	8



## ***Editor's Desk***

-continued from page 1

A high frequency power supply is used to charge a bank of large capacitors.

When the capacitors are full they dump their entire charge into an electrode mounted close to, but not in contact with, the surface to be machined. Water or dielectric oil flushes the gap between the electrode and the metal to remove the "spark eroded" material. Making many small sparks instead of fewer large sparks leaves a fine, even finish, but cuts very slowly. Increasing the power cuts faster, but leaves a rougher finish. The interesting thing about this process is that it cuts a hole the shape of the electrode. Square, round, star shaped, even words, it doesn't matter. Want to cut a really deep hole? Have the electrode made to deliver the flushing oil down through a hole in its center to keep the gap clear.

Three types of EDM machines are in use. The first is the plunge EDM machine. Shape your electrode and the machine slowly feeds it into the work piece to make your hole. The second is called Wire EDM. This machine acts like a band saw. The wire is fed from one spool to another with the work piece in between them. As the work is fed into the moving wire the sparks cut a slot. Mount a wire EDM machine to a two axis CNC table and you can easily cut out odd shapes with very thin cross sections. The last EDM machine is a type of grinder. A round electrode with any contour you want cut into the sides is spun against the moving work piece. The contour is cut into the surface without the grinding wheel ever touching the part. Far less heat is introduced into the work making it possible to grind items that would otherwise be too hard, brittle, delicate, or flexible. Used industrial EDM machines require more space and power than most people can afford, but you can buy the plans and building instructions for small, table top machines. One of the best uses for an EDM is removing broken taps without damaging the work piece.

Next on the list are Laser Etching and Cutting Machines. Most people think of huge, dangerous power supplies and bulky machinery

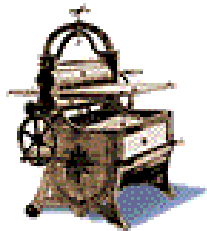
when they think of lasers. What many don't realize is that many of your computer drives are now laser devices. Small semiconductor chips called laser diodes produce laser light, yet require none of the fancy power supplies, cooling systems, or complicated controls once needed. If you have \$300-\$400, you can buy a laser pointer powerful enough to ignite paper. For a little more money, you can buy a system that will etch glass, metal, wood, plastics and many other materials. I was in the mall a while ago and noticed that a store selling keepsakes had one behind the counter. You could have cigarette lighters, charm bracelets, beer mugs and the like etched with your name or your favorite picture for a few dollars. You can buy the machines for less than \$2000. Good ones will cut rather than etch materials, even thin sheet metal for reed valves, balsawood for model airplane ribs, and paper for art work. No, they won't cut steel plate, and even the thickness of shim stock they will penetrate is limited, but they are little more than the size of a desktop printer and will run on a program you install on a PC. Imagine what you could do with one!

CNC router tables have been around for a long time now, but the quality of the machines has dramatically improved. If you've ever seen a panel saw in a Home Depot you know what one looks like. It's an aluminum frame with rails along the two longest sides. The rails hold a cross slide with a carriage on it. A high power router is mounted to the carriage by a motor driven actuator. The cross slide and carriage will transport the router to any locations on a table held by the aluminum frame. The actuator plunges the router into whatever material is clamped to the table. Using a simple CNC program run by a PC, many builders are using these router tables to cut out boat frames, experimental aircraft parts, decorative signs, sheet metal destined for custom car bodies and almost anything else you could imagine. Of course, you don't have to use a router head. You can replace it with a drill or a plasma cutter if you like. I saw an article in Popular Science magazine recently. It showed a guy making the framework for superlight surfboards out of cardboard with one of these machines. The parts assembled by aligning matching slots and were held in place with spray glue. The completed structure was covered with fiberglass and weighed less than 10 pounds. Incredible!

Of course most of us have heard of CNC, computer numeric control. A few of us have CNC on our milling machines or lathes...simple 3 axis

systems that set us back between \$2000 and \$16,000 dollars. These systems have been around long enough that some of us are looking for the next generation of CNC. I recently purchase a 4<sup>th</sup> axis for my machine. In addition to X, Y and Z I now have (though not installed yet) a rotary axis that can be mounted vertically or horizontally. And for those whom have one of those mini machines, you can buy a full 5 axis system for use on a Slim Line or similar mini mill. Whatever you make won't be very big, but it will be stunning!

Rats! I'm running out of space...and time. Next month...Micro Machines, Hobby Style!



## ***NEMES Gazette Editorial Schedule***

<u>Issue</u>	<u>closing date for contributions</u>
Aug '09	July 24, 2009
Sept. '09	August 21, 2009
Oct. '09	September 18, 2009
Nov. '09	October 23, 2009



## ***President's Corner***

Dick Boucher

### **The Meeting**

It is hard to believe I am writing about the July meeting already. As in the past, July is a poster meeting. I am hoping that there will be many completed projects and a good amount of projects in the building stage at the meeting

### ***Miscellaneous Ramblings***

Well, despite the really rainy weather, Bea and I have been able to attend a number of events that are of interest to model engineers.

The first event in the few rain-free weekends was the New Hampshire Power of the Past

Collectors Show in Dunstable MA. The weather was great compared to the deluge that we had at that show last year with many members of our society in attendance. As usual Norm Jones had his canopy set up and welcomed others from our group to join him.

The next event was a 40<sup>th</sup> wedding anniversary gathering in Moultonborough NH. The hostess, who joined us on the Cabin Fever bus trip last January, decided she wanted a steam event to celebrate with and the guests agreed it would be a great idea. The Granite State Gas and Steam Engine Association portable boiler was pressed into service to supply steam for the steam table. This was so much nicer than a compressor, and the weather cooperated nicely for the day. Along with the models and full size engines at the house there were steamboats on Lake Winnepesaukee giving rides. Todd Cahill had some small steam engines on the steam table and Ed Seldon had an unusual design engine also running. Russ Steves had his steamboat on the lake and treated us to a couple firings of his cannon at the house. I had my "Tom Thumb" in steam on the rollers.

Moving on, we attended a live steam railroad meet in Brookfield MA. Once again the weather broke for that day. The great thing about that meet was I that I finally got to see and ride behind Wayne Singer's great 1-½ scale Climax locomotive. Some of you might remember the February shows when Wayne was just beginning to build this engine and had some of the parts on display. It would be nice if he could bring the completed engine to the show but he tells me that it would be too difficult to get it out of its winter storage place to bring. Keep track of Wayne at the February shows, I have it on good knowledge he is planning another logging engine.

For the North Shore Old Car Club's show at Topsfield, the weather didn't cooperate at all. Ed Rogers arranges for us to share in that great event. Ed got us set up in the Exhibition Hall on the grounds. We were out of the weather but near an open door, so we could run our engines, both steam and gas. Those in attendance were Frank Stauffer with his Ryder Erickson water pump, Oliver Egleston brought his steam launch. Henry Szostek in usual Henry fashion had the largest brass navel cannon, complete with carriage, that I have ever seen in the model realm. Max ben-Aaron brought a small watchmaker's lathe with a number of interesting features on it that he had rescued many years ago. I brought one of the "Frodo" locomotive chassis that the group is building in my shop on Monday

evenings. Finally and not by any chance least, Ed Rogers and Herb Cotterly had their usual fine display of I.C. engines. All in all it was a great day despite the foul weather.

We have received two invitations to display at events this summer. Curtis White contacted me about displaying our engines in the Founders Day Celebration at the Saugus Iron Works on September 12<sup>th</sup>. The second invitation came from Dave Fletcher concerning the Walker Transportation Collection 40<sup>th</sup> Anniversary at the Beverly Historical Society. Beverly Mass. on August 15<sup>th</sup>. I am mentioning these events to get the word out early and will have more information as soon as possible. We still have some time to organize the Saugus Iron Works event but time is short for the Beverly Historical event, so contact me directly for information if you are interested in going.

Finally I received the following request from a woman in Amherst Mass. She has heard about my working with a couple young fellows and was wondering if anyone in her area would be interested in having her son and husband as apprentices in the hobby.

Hello Mr. Boucher,

My husband and 12yr old son picked up NE Model Eng. Society's brochure at an event held recently in Bernardston, MA. My son is homeschooled and is currently pursuing engines, rocketry, car making, alternative fuels, steam engines, alternative energy, bicycles with motors and various other engineering modalities with enthusiasm. He works on his own or with his father in our shop and utilizes some of the power tools there to build various working and nonworking creations. I'd like to support his interest further by surrounding him with other opportunities to be with like minded, creative, hands-on folks. I hope to find someone as a tutor in the engineering dept. at UMASS but also I'd like to see if anyone in your group might be interested in working one on one or in a group setting with young people (We're also involved in a large home school network in western MA.). The interaction could simply be one of exposure, where Nick helps someone work on their own project, nothing too formal. Please pass this note onto others in your group if appropriate. We live near Amherst, MA and would be willing to travel, though the specifics would need to be worked out. Thanks so much for your help. Heather Hutchinson

As I am writing this, my 11 year old apprentice is making a radial engine cowling complete with Hamilton Standard variable-pitch

propeller hub on the new ML-210 mini lathe. It is great to see how far this young man has gone in almost a year, coming over on Tuesday mornings. He can draw up a project in CAD and go into the shop and build his project almost without help. The other young fellow, who just started in our group, has purchased an EMCO lathe/mill and is getting started on his own shop. I sure hope someone can come forward to help the fellow in Amherst.

I guess the just about covers it for this month, see you at the meeting

Dick B.



## *The Steam Man of the Prairies.*

BY EDWARDS ELLIS,

### **CHAPTER XVII.**

#### **HOMEWARD BOUND.**

THE punishment administered to the Indians who had so greatly annoyed the miners proved a very beneficial one.

Nothing more was seen of them, except one or two glimpses of the red-skin upon his black horse. He, however, maintained a respectful distance, and at the end of a day or two disappeared altogether.

These were golden moments indeed to the miners, and they improved them to the utmost. From earliest light until the darkness of night they toiled almost unceasingly. Half the time they went hungry rather than stop their work to procure that which was so much needed. When, however, the wants of nature could no longer be trifled with, Baldy took his rifle

and started off on a hunt, which was sure to be brief and successful.

Sometimes he caught sight of some game in the gulch, and sometimes something in the air drew the fire of his unerring rifle, and the miners feasted and worked as only such violently laboring men can do.

Although the boy was unable to assist at the severe labor, yet he soon demonstrated his genius and usefulness. He not only constructed a dam, but made a “rocker,” or machine, of an original style, that did the work far more expeditiously and thoroughly than it had yet been done.

While the men were getting the auriferous sand, he separated it from the particles of dirt and gravel, without any assistance from them, and without any severe labor for himself.

There was some apprehension upon the part of all that the huge trapper, whom young Brainerd had met at night, would make his appearance. Should he do so, it would be certain to precipitate a difficulty of the worst kind, as he was morose, sullen, treacherous, envious and reckless of danger.

Baldy Bicknell really feared him more than he did the Indians, and the constant watchfulness he exercised for several days showed how great was his apprehension.

Fortunately, indeed, for all concerned, the giant hunter continued his travels in a different direction, and the miners were undisturbed by him.

Two weeks passed, by the end of which time the ravine was about exhausted of its precious stuff, and the miners made their preparations for going home.

It was impossible to do anything more than conjecture the amount of wealth they had obtained, but Baldy was sure that there was enough, when sold, to buy each of them a handsome farm.

“Jerusalem! but naow ain’t that good?” exclaimed the delighted Ethan Hopkins, as he mopped off his perspiring forehead. “That ‘ere encourages me to take a step that I’ve often contemplated.”

“What might the same be?”

“Git married; me and Seraphenia Pike hev been engaged for the last ten years, and now I’ll be hanged ef I don’t go home and get spliced.”

“And it’s myself that’ll do the same,” added Mickey, as he executed an Irish jig on the hard earth in front of their cavern home, after they had concluded to leave the place.

“Where does she reside?” inquired Ethan.

“Ballyduff, Kings county in the City of the Sea; it’s there that lives the lass that’s to have the honor of becoming Mrs. McSquizzle, and becomin’ the mither of her own children. Arrah, but isn’t the same a beauty?”

“The same as my own, Michael,” ventured the Yankee, who deemed it his duty to correct this general remark of his friend.

“Arrah, now, get out wid ye! she can’t begin wid Miss Bridget Moghlaghighogh that resides wid her mithor and two pigs on the out-skirts of Ballyduff, in the wee cabin that has the one room and the one windy. Warrah, warrah, now isn’t she a jewel?”

“And so is Seraphenia.”

“But has she the rid hair, that makes it onnecessary for them to have the candle lit at night? and has she the same beautiful freckles, the size of a ha’penny, on the face and the nose, that has such an iligant turn up at the end, that she used to hang her bonnet on it? Arrah, now, and didn’t she have the swate teeth—six of the same that were so broad that they filled her mouth—and it was none of yer gimblet holes that was her month, but a beautiful one, that when she smiled went round to her ears, did the same. And her shoes! but you orter seen them.”

“Why so?”

“What was the matter with her shoes?”

“Nothing was the same. They was the shoes that the little pigs went to slaap in, afore they got so big that they couldn’t get in them, and then it was her brother that used one of them same for a trunk when he imigrated to Ameriky. Arrah, now, but wasn’t me own Bridget a jewel?”

“Jehosephat! I should think she was!” exclaimed Hopkins, who had listened in amazement to this enumeration of the beauties of the gentle Irish lass, who had won the affections of Mickey McSquizzle. “No doubt she had a sweet disposition.”

“Indeed she had, had she; it was that of an angel, was the same. It was niver that I staid there a night courtin’ the same that she didn’t smash her shillaleh

to smithereens over me head. Do yees observe that?" asked Mickey, removing his hat, and displaying a sear that extended half way across his head.

"I don't see how any one can help seeing that."

"Well, that was the parting salute of Bridget, as I started for Ameriky. Arrah, now, but she did the same in style."

"That was her parting memento, was it?"

"Yes; I gave her the black eye, and she did the same fur me, and I niver takes off me hat to scratch me head that I don't think of the swate gal that I left at home."

And thereupon the Irishman began whistling "The Girl I Left Behind Me," accompanying it with a sort of waltzing dance, kept with remarkably good time.

"And so you intend to marry her?" inquired Hopkins, with no little amazement.

"It's that I do, ef I finds her heart fraa when I return to Ballyduff. You know, that the leikes of her is sought by all the lads in Kings county, and to save braaking their hearts, she may share the shanty of some of 'em."

"Jerusalem! but she is the all-firedest critter I ever heard tell on."

"What does ye maan by that?" demanded the Irishman, instantly flaring up; "does ye maan to insinooate that she isn't the most charming craater in the whole counthry?"

"You'll allow me to except my own Seraphenia?"

"Niver a once."

"Then I'll do it whether you like it or not. Your gal can't begin with mine, and never could."

"That I don't allow any man to say?"

And the Irishman immediately began divesting himself of his coat, preparatory to settling the difference in the characteristic Irish manner. Nothing loth, the Yankee put himself in attitude, determined to stand up for the rights of his fair one, no matter by whom assailed.

Matters having progressed so far, there undoubtedly would have been a set-to between them, had not the trapper interfered. He and the boy were engaged in preparing the steam man and wagon for starting, when the excited words

drew their attention, and seeing that a fight was imminent, Baldy advanced to where they stood and said:

"Not another word, or skulp me! ef I don't hammer both of you till thar's nothin' left o' you."

This was unequivocal language, and neither of the combatants misunderstood it. All belligerent manifestations ceased at once, and they turned to in assisting in the preparations for moving.

When all four were seated in the wagon, with their necessary baggage about them, it was found that there was comparatively little room for the wood. When they had stored all that they could well carry, it was found that there was hardly enough to last them twelve hours, so that there was considerable risk run from this single fact.

The steam man, however, stepped off with as much ease as when drawing the wagon with a single occupant. The boy let on enough of steam to keep up a rattling pace, and to give the assurance that they were progressing homeward in the fastest manner possible.

Toward the middle of the afternoon a storm suddenly came up and the rain poured in torrents. As the best they could do, they book refuge in a grove, where by stretching the canvas over themselves and the steam man, they managed to keep free from the wet.

The steam man was not intended to travel during stormy weather, and so they allowed him to rest.





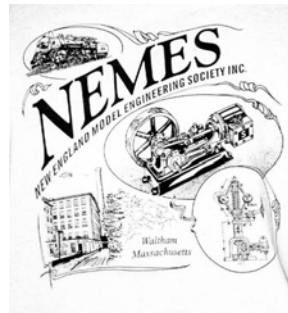
*For Sale*

*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

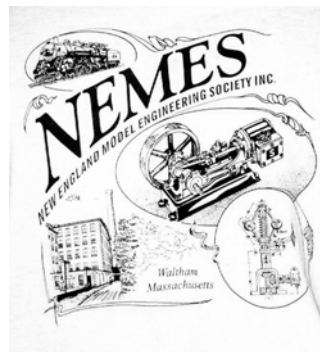


*NEMES clothing*

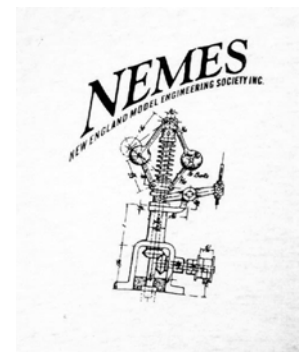
*NEMES Tee Shirts*

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](mailto:mdbouch@hotmail.com)



**MARK  
THIS  
DATE**

## **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*

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.

July 2<sup>nd</sup> Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry  
Waltham, MA  
781-893-5410  
<http://www.neme-s.org>

July 4<sup>th</sup> Antique Engine Meet & Tractor Pull  
Boothbay Railway Village  
Rt 27 Boothbay ME  
[www.railwayvillage.org](http://www.railwayvillage.org)

July 4<sup>th</sup>-5<sup>th</sup> Fabulous 50s, Sensational 60s &  
Antique Aeroplane Show  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>

July 12<sup>th</sup> Pepperell Show  
RT 111 Pepperell, MA  
Ken Spalding 978-433-5540

July 19<sup>th</sup> 9:00AM The Flea at MIT  
Albany Street Garage at the corner of Albany  
and Main Streets in Cambridge

July 18<sup>th</sup>-19<sup>th</sup> Trucks, Tractors, Commercial  
Vehicles Antique Aeroplane Show Owls Head  
Transportation Museum Owls ME  
<http://www.ohtm.org/>

July 24<sup>th</sup>-26<sup>th</sup> Eliot Antique Tractor & Engine Show  
Raitt Homestead Farm, Rt 103, Eliot ME.  
Lisa Raitt 207-748-3303  
<http://eliotantiquetractorandengine.org>

July 25<sup>th</sup>-26<sup>th</sup> Wings & Wheels Spectacular &  
Aerobatic Airshow  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>

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

Aug 1<sup>st</sup>-2<sup>nd</sup> Scribner's Mill Show  
Sebago Lake Region near Harrison ME  
207-583-6455

Aug 8<sup>th</sup>-9<sup>th</sup> Straw Hollow Engine Show  
Boylston, MA  
J. A. Resseguie 508-869-2089

Aug 15<sup>th</sup>-16<sup>th</sup> Mystic Marine Engine Show  
Mystic Ct.  
<http://www.mysticseaport.org/>

Aug 16<sup>th</sup> 9:00AM The Flea at MIT  
Albany Street Garage at the corner of Albany and  
Main Streets in Cambridge

Aug 22<sup>nd</sup> 32<sup>nd</sup> Annual New England Auto Auction  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>

Aug 29<sup>th</sup>-30<sup>th</sup> 39<sup>th</sup> Annual Meet  
Waushakum Live Steamers  
Holliston MA  
<http://www.steamingpriest.com/wls/>

Sept 5<sup>th</sup>-6<sup>th</sup> Vintage Motorcycle Meet & Antique  
Aeroplane Show  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>