

The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 139

November 2007

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Editor's Desk

Victor Kozakevich

While researching stepper motor drives on Google, I ran across a site about safecracking. Recalling the talk the late John Alden gave to NEMES about his career as a licensed safecracker, I thought I'd offer this in his memory.

A couple of MIT students acquired a "mystery" safe with a forgotten combination. When MIT types are faced with a problem, they use the natural solution: build a robot to solve it!

John used the fast approach of drilling a hole (located using his expert knowledge), looking inside and lining up the disk notches. The robot basically tries all possible combinations until the safe opens. A three number combination on a 100 step dial is a million possibilities, but mechanical limitations mean there are really only 100K combinations to try.

The robot needed a computer controlled stepper to turn the dial and a servo motor to twist the bolt retractor after each try. Well, 21,000 tries and it opened. No gold or secret documents, but an interesting take on an old art.

More at:
<http://web.mit.edu/kvogt/www/safecracker.html>

Next Meeting

Thursday, Nov. 1, 2007

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

Membership Info

Annual dues of \$25 (via checks made payable to "NEMES" and mailed to our membership secretary) for the calendar year are due by December 31st of the prior year.

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

Addresses are in the left column.

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President's Corner

Dick Boucher

The Meeting

I will not be able to make the meeting this month. Frank Dorion will be leading the meeting for me. I ask you to make it as easy for him as you do for me. One of the things that makes it easier to run a meeting is when there is a lot of Show and Tell, so scratch your heads and bring something along to the meeting to say a few words about.

This month our own member Harvey Noel will be spending a few minutes talking about his experience scraping in his lathe bed and then show the instructional video he used to learn the process. Harvey has a couple of 24-inch straight edges he purchased to do his scraping and is planning to sell them on e-Bay unless the society considers that it might be in our members' interest to purchase them for members to use.

Miscellaneous Ramblings

Well, the month of October has really flown by for me (pardon the pun.) My first event was the visit at the Lawrence Airport of the EAA's B-17. Bea and I took a tour through that airplane. Besides getting a close-up look at the Wright radial engines sitting proudly on the wings, I was taken aback at the realization that if scaled up, the thickness of the aluminum skin covering that aircraft it was probably thinner than the covering on the airplanes Ray Harlan flew for us at the May meeting. I also got a real appreciation of the young men that flew the turret gunner position on that airplane. They got into that little bubble before take off and stayed there for the duration of the flight.

The next event was the Collins Foundation displaying their B-17 Flying Fortress, a B-24 Liberator and a B-25 Mitchell at the Beverly Airport. I was there when the three aircraft departed the field. Can there be a sound as sweet as these big radials being fired up or the

drone as they head down the runway? They fired up the B-17 first, then the B-24, and finally the B-25. From the sound of the two engines on that aircraft, you could tell that it was the "Hot Rod" of the group. You will remember that that was the aircraft that Billy Mitchell's group flew off a carrier deck in WWII.



1926 Autocar dump coal truck

The final great gathering of the month was the Steam Muster at the Essex Shipbuilding Museum in Essex Mass. The list of usual suspects from our group: Ed Rogers, Todd Cahill, Les Russell and Norm Jones were under a tent with their creations. I hope I didn't miss anyone. Russ Steves and two other steamboat owners were giving rides on the Essex River all day. Along with many other steam displays, Dave Dearborn was driving an as-is, as-found, 1926 Autocar dump coal truck through the display area. The two-cylinder flat opposed engine in that machine would make a great model.

Dick B.



The Meeting

Todd Cahill

A tale of three Presidents

As is the usual fashion, President Emeritus Norm Jones exits the meeting for a few minutes to lock the front door to the museum. At this time, Venerable President Richard Boucher calls the meeting to order and reminds us of the parking rules for the members. Mr. Boucher also often reminds us of his most difficult task, that of finding a successor. It was commented that Mr. Jones, always eager to speak during the show and tell period, could be a suitable successor to the Presidency. It has also been repeated many times that Founding President, Ron Ginger started the club with the intent that it *not* be a railroad club. Although the trainman at the helm now hasn't turned it into a railroad club per se, there have been more than a few meetings lately about automobiles. Hmm...

Who's towing whom?

Wayne Singer spent eleven years building a double scale Kozo Climax locomotive. It had its maiden run in June at the Adirondack Live Steamers. An unfortunate incident involving a faulty water pump caused Wayne to dump the fire and had to get towed back to the steaming bay by (horror!) a diesel electric locomotive. Coming into the bays, Wayne spied Webmaster Earl Groff with video camera in hand and to prevent his indignity being captured on film. Wayne used what remaining pressure he had to propel his loco, declaring that he was indeed towing the Diesel. Since then he has had more success with his locomotive but claims "it eats coal like I eat potato chips and drinks like a drunken sailor".

Does your dog bite?

Harvey Noel brought in some lathe dogs free to anyone that wanted one. These were of the non-OSHA approved variety with the square headed bolts instead of the Allen set screw. If you truly would like your antique lathe to look authentic they are the dogs for you. If you don't like your hand getting bit by a revolving bolt perhaps you could use it as a static display.

Oneth by lantern, Twoeth by Aloris

Webmaster and machine shop teacher Errol Groff has been ordered by his school to get rid of a lot of iron in the form of machine parts that has accumulated over the years. Any takers for lantern style tool holders? Didn't seem to be. He will be bringing stuff to the meetings over the next few months.

Featured Speaker

Our main speaker for the evening, Max Hall, explained and illustrated the systems that go into Hybrid Vehicles. Max has built a few hybrid vehicles. Explaining his whole talk would require more time from me and more pages added to our humble little gazette. In the interest of keeping our postage rate down (yeah, right) I will only give a brief summary of some of the things spoke of.

There are two types of Hybrid vehicles:

Serial drive hybrids: Use an internal combustion engine to drive an electric generator, which in turn supplies electrical power either to storage batteries or directly to traction motors, which turn the wheels.

Parallel Hybrids: An internal combustion engine or an electric motor can power the final drive. Various clutches installed in the drive train also allow the use of regenerative braking, whereby the kinetic energy in braking is recaptured in powering the generator.

Then there is Max's hybrid. His vehicle is built on the platform of a 1965 Italian three-wheeler. It tows a trailer with the IC engine in it. His fuel source is propane. It weighs in at 1100 pounds. More than half the weight is in the bank of lead-acid batteries. Modern microcontrollers and solid-state electrical management and sensors maximize efficiency. Pulse-width modulation is used to reduce electrical current without giving up any of the electrical potential energy. Transistors are pulsed on or off at a rate of 15,000 times per second.... Mama Mia!

Some alternative fuel sources for bio diesel were mentioned:

- Unmodified vegetable oil
- Used vegetable oil from fryers
- Certain types of algae have half their weight in vegetable oil.
- Rendered guts from turkeys and chickens can be mixed with plant oils (so much for calling these vehicles vegetarians).
- Ethanol produced from corn is very common but can cause instability in the food markets.

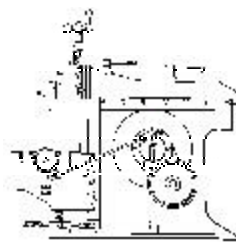
When asked if he drove his vehicle to the meeting, Max proclaimed how reliable the vehicle is, but, no, he didn't drive it to the meeting.



Treasurer's Report

Dick Koolish

Balance as of August 21, 2007	8058.39
September Gazette	-227.16
Brass for whistles	-218.40
1 member dues 1/2 year	+ 15.00
October Gazette	-216.38
Speaker fee	-50.00
Balance as of October 17, 2007	7361.45



Shaper Column

Kay Fisher

Eric LaVelle - 15" Springfield Shaper

This month's acquisition and rebuild story is from Eric Lavelle from Belleville, Illinois.

"I really want to use my shaper to make and repair gears for other machines as well as the more standard uses for shapers.



Left

Photo by Eric Lavelle

It all started with an eBay search. Many searches of eBay, classified ads, and auctioneer sites had only shown me shapers which were a thousand miles away and cheap, or really close and really expensive. Finally, there was a listing for a flat belt driven Springfield shaper which was only 250 miles away with a start bid of \$50, and was a model first produced in the late 1800s, my era of choice. I waited impatiently for the end of the auction, bid in the last few seconds as usual to avoid both auction fever and other bidders slowly pushing my bid up to the max. All went well, I was the only bidder.



Right Photo by Eric Lavelle

After a bit of correspondence with the seller, Joe, I set out with my trusty minivan and trailer to retrieve my prize. The drive went well, with none of my previous problems of blowouts, failed trailer bearings, and random intermittent electrical problems. Joe was waiting for me at the front of his garage/shop with an engine hoist to help me load the machine. The old catalog weight was 1550 lbs. which was enough to tip the hoist forward. We walked around his shop grabbing some weights, chucks, etc. to weight down the back of the hoist, and everything went smoothly. I spent some time looking at Joe's various other metalworking machines. He had a nice restored Bridgeport, an old horizontal mill, a small lathe, and one really big lathe in excellent condition. After some good conversation, I strapped down the load and headed for home.



Before Left Photo by Eric Lavelle

The following morning I looked the machine over real well and took pictures of the mechanisms to help with reassembly. There was a good bit of rust on all the exposed machined surfaces. I had already decided I would take it apart right there on my trailer, clean it, paint the parts, then reassemble it after moving it into my metalworking shop.



Before Right Photo by Eric Lavelle

First, I removed the automatic cross feed mechanisms followed by the ram and the table.



Journey Photo by Eric Lavelle



Ram Photo by Eric Lavelle

After that, I carefully and thoughtfully tackled the threaded rod for the table cross feed. The threads on it were rusty, so I cleaned them up to allow it to move without binding on the rust. Next, I carefully examined the collars on the end of the rod, one of which had a set screw in it. The other looked like it was just a spacer. I tapped on them for awhile and finally figured out that even with the set screw, they were both threaded on. After taking those off, I was able to remove the feed rod allowing me to easily remove the saddle. The next order of operations was to remove the cone pulley. The diameter of the shaft on the pulley end was fairly large, which always makes for trouble removing it. The other end simply had a set screw collar on it. Since I didn't have a lead hammer, I took a big babbitt ingot, put a 1½" diameter piece of scrap shaft against the shaft inside the cone pulley and gave it a few good whacks after heating it with a MAPP gas torch. It moved just enough to get a gear puller around the collar on the opposite end.

hammer to drive the shaft through the pulley. The last part of the disassembly was removing the bull gear and the iron rocker arm that drives the ram. The rocker arm pivots on a shaft which was easily removed after loosening some set screws. Once the arm was out, the bull gear came out through the door in the casting.

The great thing about the shaper restoration is that I was able to disassemble it in about 2 days, only ended up with a 5 gallon bucket half full of small parts, and there aren't too many larger parts.



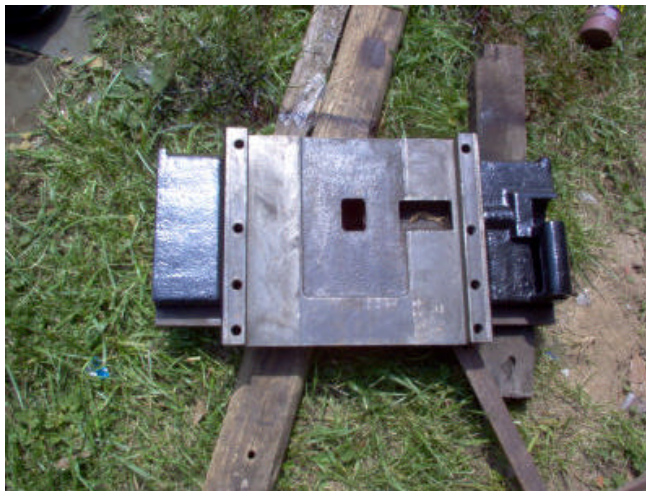
Base Stripped Photo by Eric Lavelle

It was here that I learned the lesson to take every set screw all the way out of the collar. Instead of just having the set screw against the shaft, they had drilled a hole into the shaft to keep it from moving. I had backed the set screw out quite a bit, but not quite enough. The gear puller shattered the collar. It's a good thing those are readily available stock parts. The carnage allowed me to remove the shaft which still held the cone pulley. I put the shaft through a hole in my workbench, allowing the wide part of the pulley to be supported by the surface of the bench. I hosed it down with penetrating oil, heated it, and used the scrap shaft and a large



Parts Bucket Photo by Eric Lavelle

This is a nice change from my Becker Brainard #2 Universal horizontal mill which took me a year to figure out how to disassemble, left me with tubs full of small parts and the floor of a whole room strewn with the larger parts.



Saddle Photo by Eric Lavelle

The real nasty part was just beginning. I cleaned all the parts with wire wheels. For the larger castings I used an angle grinder with a knotted wire cup. For small parts I used a bench grinder with a wire wheel.

For hard to reach areas, bores, gear teeth, and delicate machined surfaces, I used a drill with various wire wheels and an extension. When there was stubborn rust on machined surfaces, I used the angle grinder with a well worn knotted wire cup gently to avoid taking off any metal.

One of the problems was rusty t-slots. I was about to use electrolysis, but the thought of lifting the table and setting it in the bottom of a trash can tank didn't suit me. Nor did the fact I'd have wet iron when I pulled it out which would need a quick wire brushing anyway. I went down to Ace Hardware and found a 1½" diameter wire wheel. This is a size that they don't normally carry. The big box stores also don't usually carry this size wire wheel. It was actually the smallest one I'd ever seen and they only had one. Maybe it came with a box of odds and ends. It was still a little big for the t-slots, so I set it edge up on the workbench and smashed the bristles down with a hammer. After that it fit tightly down the slot and cleaned the rust out very well, very quickly. The info on the packaging that held the wire wheel says Forney Industries, Inc. catalog number 60013. I'm sure any local hardware store could order one, even if they don't normally stock them.

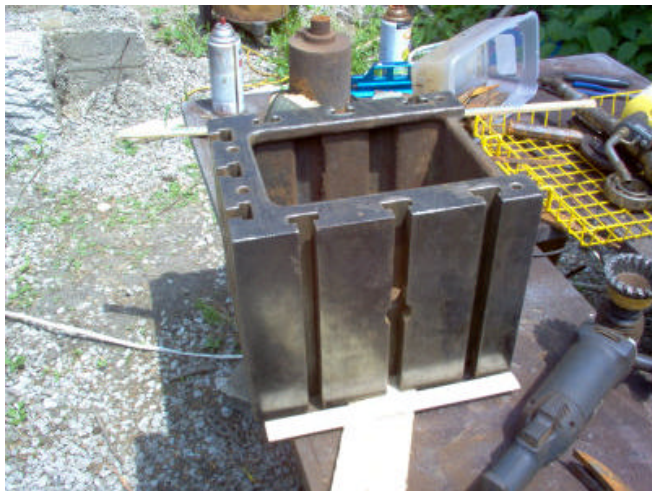
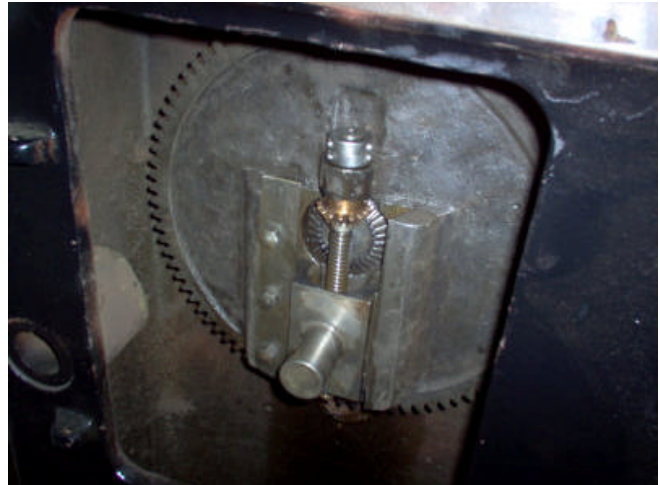


Table Photo by Eric Lavelle

The cleaning process took several very long and dirty days.

When I got the machine, it was green, but you could see that it had been repainted several times. I decided to use black since it's a period color, matches all the other machines in my shop, and is easy to touch up since I keep a supply of it. I took some time taping the machined surfaces, but not enough time

because I got some overspray on parts of it anyway. Oh well, nothing a wire wheel won't fix. I used Rustoleum rusty metal primer and gloss black in spray cans. I use the spray because I can put the top coat over the primer right away, and the whole thing dries much faster than brush paint. The gloss is a bit shiny for an old machine, but I find that it cleans easier than other paints.



Install Bull Gear Photo by Eric Lavelle



Install Rocker Arm Photo by Eric Lavelle

Reassembly of the shaper was pretty straightforward. First, I cleaned all the oil ports. Most of them had long been clogged with dirt. Next, I put the bull gear back in, then the rocker arm, the ram, the gearing that operates the auto feed, the cone pulley and shaft, the saddle, and the table.



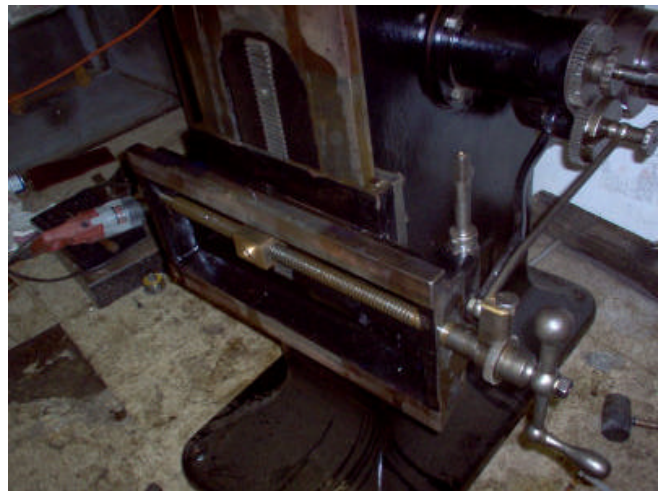
Install Ram Lead Screw Photo by Eric Lavelle



Install Saddle Photo by Eric Lavelle



Install Ram Photo by Eric Lavelle



Install Auto Feed Linkage Photo by Eric Lavelle



Install Auto Feed Gears Photo by Eric Lavelle

The areas that look slightly rusty on the ways are actually shadows of Rustoleum primer overspray that wouldn't quite brush out. All of the adjustments, frozen before, now operate very smoothly.

It'll be a few months before I actually power it due to the need for a 14ft piece of line shaft."

Thanks Peter for that great acquisition and rebuild story.

Keep sending me email with questions and interesting shaper stories.

My email address is:

KayPatFisher@gmail.com

Kay



Shop Tips

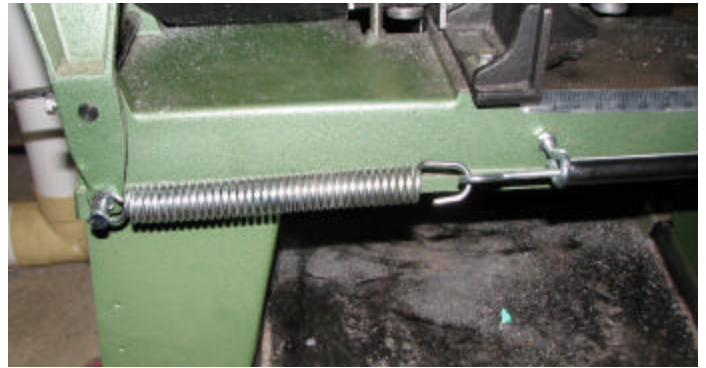
Adding a Shock Absorber to a 4x6 Bandsaw

Last month, I showed how to make a universal table for the 4x6 bandsaw. Here's another simple modification for your 4x6 bandsaw. This modification only required making one part, and that only required a drill, a tap and a saw.

Large, commercial bandsaws have a damper on the down-feed so that the downward cut goes at a constant speed regardless of material thickness. This increases blade life and prevents jamming. Cheap, home duty saws like my Harbor Freight 4x6 "greenie" only have a spring for downward regulation. The spring works surprisingly well, but it seems that a damper would be a good addition.

On the Yahoo 4x6 bandsaw mailing list <http://groups.yahoo.com/group/4x6bandsaw/> people discuss modifying their saws with an adjustable hydraulic cylinder. This gives very gentle down-feed and control over the down-feed rate. Burden Sales Surplus Center <http://www.surpluscenter.com/> of Lincoln, Nebraska, used to sell these hydraulic cylinders but they no longer carry this size, so I set out to modify my saw with whatever was available.

Last weekend, I took my trash to the town transfer station (we call it "the dump") and investigated the metal pile. Someone threw out an exercise machine something like a Nordic Track. In addition to two sliding "skis", this machine had two pivoting, vertical "ski poles". To give the poles some resistance, there is a pneumatic cylinder attached to each pole. The cylinders have very little resistance when you push them in, but quite a bit of resistance pulling them out. I brought them home and used one of them as a damper on the down-feed of my Harbor Freight 4x6 horizontal bandsaw.



Bandsaw with factory spring, before modification

I was very lucky. This size pneumatic cylinder fits right along side the spring, and allows me to use the same mounting holes for both the spring and cylinder. I used a piece of $\frac{5}{8}$ " steel rod, 3" long to replace the screw-eye that supported the spring adjustment. I cross-drilled a $\frac{1}{4}$ " hole in the center of the rod and tapped $\frac{5}{16}$ -18 holes in the ends of the rods. One tapped hole holds the rod to the saw with a piece of threaded rod. The other hole is for a bolt and washer to hold the cylinder in place.

At the far end of the saw, I removed the short $\frac{5}{16}$ -18 spring support bolt and replaced it with a much longer bolt for both the cylinder and the spring. I used plastic bushings to center the cylinder on the bolt. These also came from the exercise machine.



Bandsaw modified with a pneumatic damping cylinder

The saw cuts more smoothly now, although a stronger cylinder would probably be even better. Someone suggested trying a storm-door damper. Maybe I'll find something even better on my next trip to the dump. ☺

Bob Neidorff



Obituary

I received the sad news that longtime NEMES member Edwin Wlodyka passed away last Friday. Ed was quite the prolific builder of wooden steam engines and mechanical contraptions. We haven't seen Ed at our meetings much lately but he was still able to get around to engine shows and recently made it up to the Steam Muster in Essex. He was a good friend and a talented individual. I will miss him.

Todd Cahill

From the MetroWest Daily News, Sunday October 21, 2007:

"Edwin W. Wlodyka "

ASHLAND - Edwin W. Wlodyka, 82, of Ashland, died Friday, Oct. 19, 2007.

He was the husband of the late Ruth (Powers) Wlodyka.

Born in Framingham, he was the son of the late Wojciech and Mary (Mika) Wlodyka. He was a graduate of Framingham High School, Class of 1942.

He attended Worcester Trade School before entering the U.S. Navy, where he served as an aviation machinist mate first class aboard the aircraft USS Guadalcanal. After World War II, he attended New England Aircraft School.

He was employed for several years by Fenwal Inc. in Ashland, in the Research Model Department. In 1961, he became manager of Highland Laboratories Inc. in Ashland, and retired as vice president in 1992. His name is on six patents.

After retirement, he was an active member of the N.E. Model Engineering Society. His workshop at home was one of his greatest enjoyments.

He leaves one son, David Wlodyka and his wife, Barbra, of Hopkinton; two daughters, Nancy Moscato and Lynn Swanson, both of Ashland; three grandchildren, Kurt Swanson of Montana, Jennifer Wlodyka of Maynard, and Rebecca Schofield and her husband, Edmund, of Whitinsville; and three great-grandchildren.

He was the brother of the late Jennie Serocki and Henry J. Wlodyka.

Funeral services are private and there are no calling hours.

Donations may be made in his memory to a charity of one's choice.

Funeral arrangements are under the direction of the Matarese Funeral Home in Ashland."

www.metrowestdailynews.com/obituaries/x1543120172



For Sale

Shaper Work CD

Put out in 1944 by the New York State education Department this 326 page manual is chock full of valuable tips and information on using the King of Machine tools....The Shaper. Covered is everything you need to know about the care and feeding of the shaper, use of the shaper, even how to sharpen tools for the shaper. Scanned and saved in Adobe Acrobat format. The CD now has a lot more info on it, and the price has increased accordingly. \$10.00, shipping included.

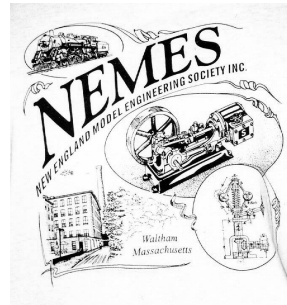
Errol Groff
180 Middle Road
Preston, CT 06365 8206
errol.groff@snet.net

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

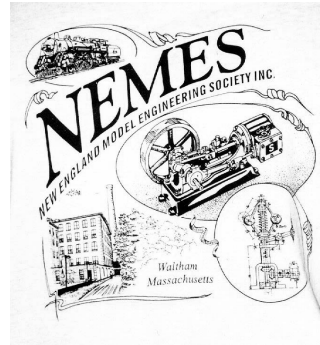


NEMES clothing

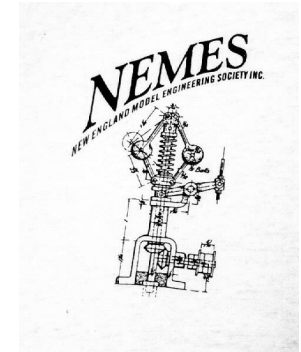
NEMES Tee Shirts

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



**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 or (508) 393-6290.

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

Nov 2, 3, and 4th
World Championship Punkin Chunkin
East of Bridgeville, Delaware
www.worldchampionshippunkinchunkin.com/

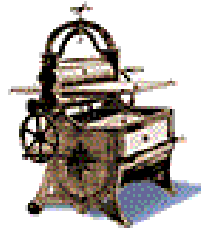
November 9, at 6:30 PM
"Made In America" TV Series to Profile Starrett
on The Travel Channel
www.starrett.com/pages/1144_made_in_america_air_dates.cfm

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

December 4, at 8:00 PM and 12:00 AM
"Made In America" TV Series to Profile Starrett
www.starrett.com/pages/1144_made_in_america_air_dates.cfm

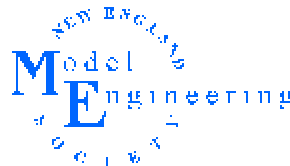
Jan 3rd Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry
Waltham, MA 781-893-5410
<http://www.neme-s.org>

Bill



NEMES Gazette Editorial Schedule

Issue	closing date for contributions
December '07	November 22, 2007
January '08	December 20, 2007
February '08	January 24, 2008
March '08	February 21, 2007



Membership Renewal Form

Renew your NEMES membership for the calendar year 2008. Enclose a check for \$25 payable to: NEMES

Name _____

Address _____

City _____ State _____ ZIP _____

Home Phone _____

Work Phone _____

Email _____

Please bring this form to the next meeting or mail to:

**Richard Koolish
212 Park Ave.
Arlington MA 02476**

(If bringing cash, place in an envelope with your name and address on outside)