



The
NEMES
 NEW ENGLAND MODEL ENGINEERING SOCIETY INC.
Gazette

No. 105

January 2005

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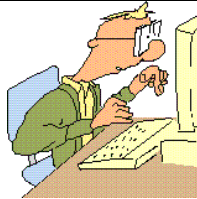
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Editor's Desk

Victor Kozakevich

Welcome back from the holidays. I hope everyone enjoyed the season. It's a bit daunting to turn the page to 2005. I hope it will be a good year for everyone.

The *Time on My Hands* column had to take a hiatus this month, but will return in February. In my spare time, I've been web researching a topic that was raised on the PBS show "The History Detectives". The particular episode investigated the authenticity of a pair of old cannon barrels that might have been among the items the British were after when they marched into Concord in April 1775. One is currently bolted to the wall inside the Bunker Hill monument. The other is stored at Charlestown Navy Yard. This might make a good set of plans for a model project. Look for a future article.

Check your mailing label on the envelope that this issue arrived in. If it says "Owes Dues for 2005", your subscription is about to expire. Send Rob McDougall a check now.

There are still a few seats left on the Cabin Fever bus. Don't get left behind!

Next Meeting

Thursday, Jan 6, 2005

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

Membership Info

Annual dues of \$25 for the calendar year are due by December 31st of the prior year. Send a check for \$25 made payable to "NEMES" to our treasurer. His address is in the right column of this page.

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

Addresses are in the left column.

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President's Corner

Norm Jones

The Meeting

The January meeting will feature one of our semi-annual "Poster Sessions". It will be an informal get together where everyone is encouraged to bring in something that they are working on. It's a great opportunity to get assistance on a particular problem or just show off your latest project.

January Meeting Location

We will be meeting in the Appleton Room instead of the Jackson Room on January 6th. We have met in the Appleton Room on several occasions in the past. The museum is booked for another event for that evening and will be off-limits. Enter the Appleton Room through a door on the walkway adjacent to the Charles River. Cross the footbridge over the river and turn right as though going to the museum entrance. The door that you want is about 100' down the walkway and will have a large "190" on top.

Chestnut Hill Water Pumps

I was pleased to finally get to see the engines at the Chestnut Hill Pumping Station on Saturday December 4th. Thanks to Al Goldberg for making arrangements for another viewing. There was quite a sizable group in attendance with a very good representation from NEMES. I took quite a number of digital pictures while there. Photographing these engines is somewhat difficult in that they are quite large and the lighting is less than ideal. Al has some great pictures on his web site at www.chwaterpumps.com. I made a return trip on December 18th with the hope of being able to see the three engines in the low service building (the one on the left), however the locks had been changed recently and we were limited to viewing them through the windows. Unfortunately those engines will be scraped shortly when the contractor rehabs that building for condominiums. The removal process should be impressive as they are going to be removed through the roof.

Cabin Fever Bus Trip Update

I am happy to announce that the bus trip is on. There is still plenty of room on the bus, so if you are able to join us please give me a call at (978) 256-9268. The deadline is January 3rd for me to send a list to the Holiday Inn if you would like the buffet. You can take advantage of the buffet on Friday night even if you don't go on the bus. The buffet cost is \$15.75 and must be paid in advance. Room reservations at the Holiday Inn on Arsenal Rd in York PA are made by calling (717) 845-5671. The rate of \$59 per night has been extended to all those who mention the NEMES Cabin Fever event whether riding on the bus or not. Those of you who are signed up will be receiving a letter from me about a week before the trip with the meeting time and place as well as a phone number to use on the day of the trip in case of emergency. Have a wonderful holiday. See you on January 6th.

Norm



The Meeting

Max ben-Aaron

Adult Kites and Kite-Building

Norm planned to have Fred Gould, an avid kite builder, show a number of his kites and give us a talk about kites. As an unexpected pleasure, we had another guest kite expert, Glenn Davison, president of Kites Over New England <http://www.kone.org>. Although they had never met before, Glenn and Fred managed to weave their presentations together in a *tour-de-force* of improvisation that was a delight to behold. The amount of information imparted was quite dense, more than can be adequately reported here, so this article can only dwell on the highlights.

Brief History of Kites

It is not certain as to where the first kites came from, but some claim that they were first known to the people of the South Sea Island, who used kites to fish, attaching bait to the tail of the kite and a web to catch the fish. Even today, some natives of the Solomon Islands in the Pacific Ocean use kites as a fishing aid. There are many stories about how the people of Micronesia used leaf kites to carry bait far out over the reefs where the gar-fish fed.

All the appropriate materials for kite-making were found in China: bamboo for the frame and silk for the sail and bridle. The exact date and origin of kites in China is not known but it is believed that they were flown more than two thousand years ago. One story is of a Chinese general, Huan Theng who, in the year 202 BCE, got the idea for a particular military strategy watching the way his hat flew from his head.

According to one story, about 300 years ago a thief was said to use a large kite to carry himself to the top of Nagoya Castle in order to steal a golden statue from the roof. All he was able to remove were a few small pieces. Later he was captured and punished severely when he bragged of his exploits.

Kites and Science

In the history of flight, the first lighter-than-air balloon (1783) and the first powered aircraft (1903) are very recent when compared with the age of kites. American diplomat and scientist Benjamin Franklin experimented with kites to investigate atmospheric electricity and kite studies were also made by the American physicist and inventor Alexander Graham Bell.

Beginning in the 1890s and continuing for about 40 years, box kites, consisting of two or more connected open-ended boxes, were used for sending meteorological instruments aloft to measure wind velocity, temperature, barometric pressure, and humidity. Blue Hills had a meteorological station in Milton MA with a steam winch for flying the kites.

On November 12, 1894, Lawrence Hargrave, who invented the "cellular kite", was lifted from the ground by a train of four of his kites. This was simply one stage in his quest for a stable lifting

surface which could then be powered and used as a means of transportation. Hargrave was doing his utmost to invent the aeroplane. Hargrave developed several styles of kites and gliders, refined and developed the concept of curved surface wings, and also invented the rotary engine. He never patented any of his inventions, preferring them to be available for the advancement of mankind.

In 1972 Peter Powell introduced a toy dual-line stunter and the public began to fly kites not only for fun, but also for sport. Enthusiasts experimented with new designs that could fly precise maneuvers, go faster, or perform intricate tricks. Competition where fliers competed to music became popular.

Larger and more powerful kites were designed and in the 1980s, Peter Lynn of New Zealand introduced a stainless steel kite powered buggy. In the 1990s, kite traction on wheels, over water, and on ice became increasingly popular. In 1999, a team used kite power to pull sleds to the North Pole.

Kites during War

The earliest written account of Chinese kite flying was about 200 B.C. when the Chinese General Han Hsin of the Han Dynasty flew a kite over the walls of a city he was attacking to measure how far his army would have to tunnel to reach past the defenses. Knowing this distance, his troops reached the inside of the city, surprised their enemy, and were victorious.

During the Silla Dynasty of Korea around the year 600, General Gim Yu-sin was ordered to subdue a revolt. However, his troops refused to fight. They had seen a large shooting star fall from the sky and believed it to be a bad omen. To regain control, the General used a large kite to carry a fire ball into the sky. The soldiers, seeing the star return to heaven, rallied and defeated the rebels.

In the late 19th and early 20th centuries, kites were used for lifting military observers to heights from which they could observe the disposition of enemy forces. In World War II, the US Navy found several uses for kites. Harry Saul's Barrage Kite prevented airplanes from flying too low over targets. Pilots lost at sea raised the Gibson-Girl Box kite so they could be found. And Paul

Garber's Target Kite, a large steerable diamond, was used for target practice and aircraft recognition at sea.

Types of Kites

When I was young, I built simple kites, either diamonds which were bowed, or flat hexagonals. Diamond kites are one of the easiest kites to fly. They adjust automatically to gentle or fresh winds and their long tails make launching a snap, even in gusty winds. The materials were bamboo spars and tissue paper, with paste made from flour and water. I soon discovered the difference made by the bridle, but I never figured out the best configuration.

The kites of today are flown for various reasons, thus giving rise to two main kite groups, categorized by their structure: stunt kites and power kites.

Box Kites are fascinating structures that, with a good wind, can fly steady as a rock. Their open centers add stability while making them unusually light on the line. The box kite, also called the Hargrave kite or the Hargrave box kite after their inventor Lawrence Hargrave. Due to their innate abilities to carry heavy payloads, steady flight, and capacity for high altitude flight, these kites have had many industrial and military uses. Box kites were used until the 1930s to carry meteorological equipment for high altitude weather studies and by the Royal Air Force as sea rescue equipment to deliver radio aerials.



Glenn Davison holding one of his box kites.

Samuel Cody (sometimes confused with Buffalo Bill Cody) an American born in Iowa in 1867, was a highly colorful and flamboyant character who enjoyed demonstrating his remarkable skills as a horseman, with the lasso and with the gun. When his interest turned to kites, after many experiments he settled on a winged variant of the Hargraves box, which has taken his name. On November 7th 1903, Cody actually crossed the channel on a vessel towed by kites.

The Circoflex is a truly stunning kite that flies with a slant balance.



Fred Gould, holding up one of his colorful Coneyne cellular kites. You can see a small part of Fred's 22' delta kite in the background

Triangular box kites can be made, but if you then add wings, the result is the Coneyne kite, also known as the French military kite since it was used by the French army for reconnaissance. It is also known as the pilot kite. Silas Coneyne, an American, patented it in 1902. Not only do the box sections form a dihedral but they also result in the center of lift being somewhat above the attachment points of the bridle. Together, these factors result in a very stable flying characteristic. Double Coneynes are often made, for French military kites have long been popular with kite-fliers. Their lifting power and stability make them ideal for high altitude flying.

Delta kites are easy to fly and make great first kites. Flying on the wind rather than against it, they soar on winds light enough to leave most kites on the ground. Semi-flexible construction lets them fly in a wide range of winds, shifting and swooping with bird-like grace at each change in

the wind. These one-liners are for those almost windless days.



Another view of Fred Gould and his 22' delta kite

Airfoils (inflatables) are graceful wind-inflated kites. Flexifoils hold the World Speed Record of 120 mph! Flexifoils are very physical kites to fly. Their unique design and smooth, nearly silent flight provides an exciting flying experience quite unlike any other stunt kite. Twenty years after their invention, they still seem like something from the next century. Having just one fiberglass spar at the leading edge and no bridle, flexifoils are simple to set up and easy to fly in stacks. They can be stacked in the same or mixed sizes to develop even more power.

Flying a stunter kite is much more exciting than traditional kite flying. Stunt kites can perform tricks and there are almost no limits to what a good stunt kite can do: 360, Axel, Backflip, Cartwheel, Cuckoo clock, Black hole, Helicopter, Walking, Pancake, Stall, or Yoyo. If the flier has a little experience, these kites can do any of these stunts. Also called sport kites, stunters have revolutionized kite flying in the past few years.

Power kites, on the other hand, serve a very different form of entertainment. They are strong, powerful flyers that are used to do various things. The most popular uses of power kites are bugging, kite sailing and kite jumping. Power kites are obviously built to be more powerful than stunt kites, because they have to be able to withstand strong winds. The kite shape also decides what group it belongs to. There are single line kites, dual line kites (probably the most popular) and quad line kites. Quad-line kites have four lines, which govern all of its flight

characteristics: speed, direction and pull. They can move forwards or backwards, at the speed you choose and center pivot turns are done simply by making one side of the kite go forward and the other side backward. These big kites develop a tremendous pull in strong winds. The sporting edge of stunt kite flying, power kites appeal to the risk taker who likes the pull and excitement at the max. The danger is obvious, but as with many sports, it's part of the appeal.

Kites can also be used for aerial photography. Digital cameras are much easier to use but some still use traditional film cameras.

Materials

Modern materials have revolutionized kite flying. Carbon and other fibers yield spars that are extraordinarily stiff and unbelievably light. Tubing and rods can be made of FWET, carbon-fiber, solid fiberglass and solid carbon-fiber, as well as bamboo and wood dowels.

New materials like rip-stop nylon, fiberglass, and carbon graphite have made kites stronger, lighter, more colorful, and more durable. Important inventions like Francis Rogallo's flexi-wing and Domina Jalbert's parafoil kites helped develop modern hang-gliders and sport parachutes.

Synthetic fibers are used to spin lines that have different characteristics. The kind of line used to fly the kite depends on the application and the preferences of the kite flyer. Some popular types are: braided Dacron™ polyester, twisted Dacron™ polyester, braided Kevlar™ aramid fiber, and Dyneema™ polyethylene fiber. Spectra™ polyethylene fiber is another extremely strong line, but it is very slippery and requires special knots.

The sail of the kite is the cloth that is put around the kite's frame. It can be made from a rip-stop, high performance fabric, such as nylon or polyester. Many other covering materials are now available: spinnaker cloth, laminates, screening, plastic sheeting, as well as the traditional paper, silk and linen fabrics.

There are many devices for playing the line out and winding it in again: spools or winders, yoyos or hoops, cards, dual-quad controls and swivels.

The pull exerted by a kite can be greater than can be managed by one individual, so often some anchoring method has to be used. Anchoring techniques include the "Big Bag O'Sand", supported stakes, an ice screw, and even a truck.

Kite-making as a hobby

Kite makers, like other hobbyists, always want something new. They build their own kites when the sort of kite that they want is not commercially available, frequently because they are trying something new, want a different scale or color or design selection, or because they are seeking some specific flight characteristics. They also try exotic materials for spars or coverings.

Kite makers use sewing machines extensively because the uniformity of the stitches is an important consideration. Stitches needed may be straight or zigzag. For slippery materials, a 'walking-foot' machine is useful.

The kite craftsman also need tools: dial calipers, hot cutters, scissors, disc cutters, straight edges, squares, saws and tubing cutters, so NEMES members should be well equipped if they want to try their hands at kite making.

In designing a kite, one needs to take into account skill level of the maker as well as the purpose, type, scale and availability of materials.

In the construction of a good kite, attention to detail is critical. Symmetry is a *sine qua non*, but some genius may yet come up with an excellent asymmetrical kite. Uniformity of thread tension, thread type (same denier), stitches/inch and seam/hem width all affect the kite.

During inclement weather, ultralight kites may be flown indoors. Ultralights need amazingly little wind to fly. Made as lightweight as possible with graphite spars, they're a bit fragile for inexperienced fliers to learn on. For more information see:

Famous Kite Pioneers © - Bob White 2002
<http://www.infocomservices.com/kites/>

Max



Treasurer's Report

Rob McDougall

As of 11/30/2004

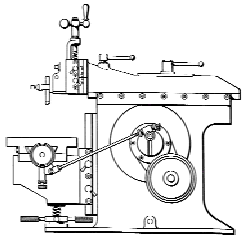
Balance as of: 09/30/2004	\$6,360.30
Interest Income – Oct	.52
Interest Income - Nov	.27
Dues Received	225.00
Gazette – Sep	-175.03
Gazette - Oct	-177.25
Office Supplies	-29.29
Shop Aprons	-519.50
Purchase of Voice Recorder	-49.99
Bank Charge*	-59.10
Balance as of: 11/30/2004	\$5,575.93

* This was a bank error. It is being reversed next month.

Because I no longer work in Boston I have transferred the club checking account to Eastern Bank in Auburndale, MA. It is a "free" checking account that earns interest on deposits.

Dues: Most members have paid up for 2005. If you haven't paid yet, please mail me a check or give it to me at the next meeting. If you wish to pay by cash, please enclose \$25.00 in a sealed self addressed envelope.

Rob



Shaper Column

Kay Fisher

Shaper Tool Bits

Part 3 of 3

The Shearing Bit

This part of the shaper bits column is another contribution by Pete Schaeffer. Shearing tools (finish tools) are documented in many old machining books, which all have sections devoted to shapers and planners. The following is from Pete's old web site, which is currently not available. To see the whole article and all the pictures in higher resolution, look at the rec.crafts.metalworking drop box archive:

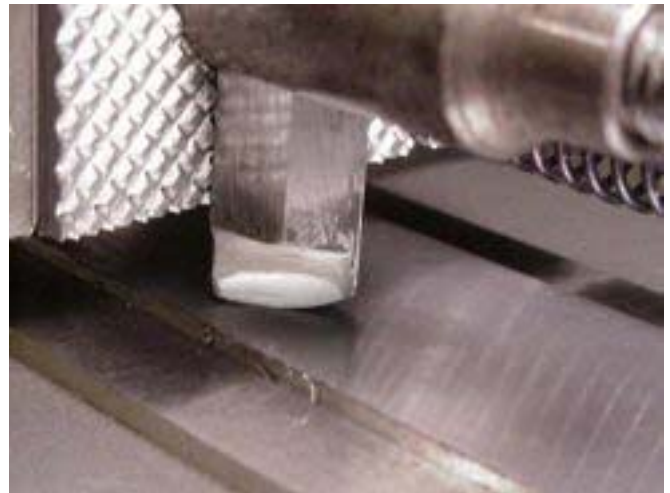
www.metalworking.com/dropbox/_2001_retired_files/

The pictures are files shaper01.jpg shaper02.jpg shaper05.jpg shaper06.jpg shaper07.jpg shaper11.jpg and the accompanying text is file shaper00.txt



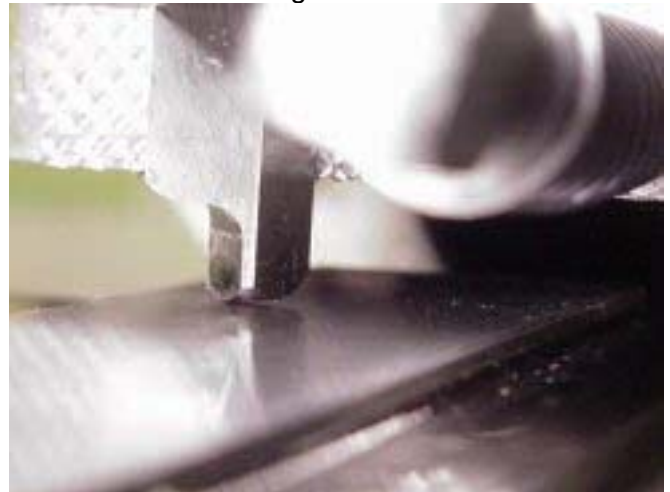
Finish Tool End Photo by Pete Schaeffer

"This is a finishing bit, pretty much as described in Moltrecht V. II, p. 14. This is the cutter shown at C in the drawing on that page. If you look it up, note that the end-on drawing in the figure is wrong: it shows the angle going backwards. In this photograph, the side of the cutter that's on top is actually the front. The edge is curved, and gets pushed through the work at an angle of 25 degrees, as specified by Moltrecht.



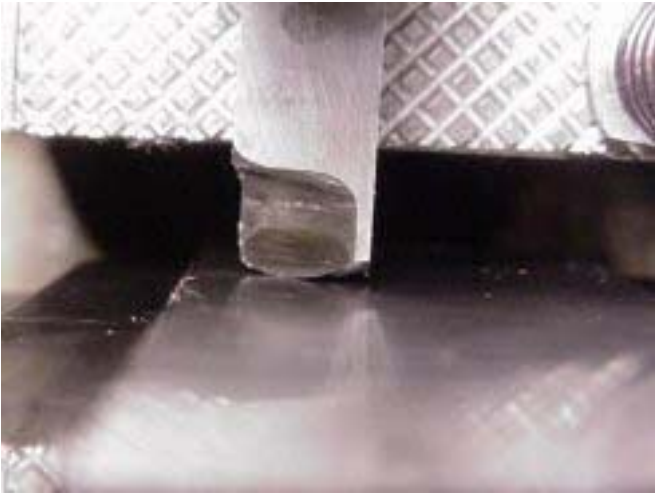
Finish Tool Left Front Photo by Pete Schaeffer

This shot gives a better view of the curved edge and the angle at which it meets the work. The cutter is mounted vertically, with little or no angle. We are standing in front of the shaper, a little to the left, looking at the left hand side of the bit, which will feed from right to left.



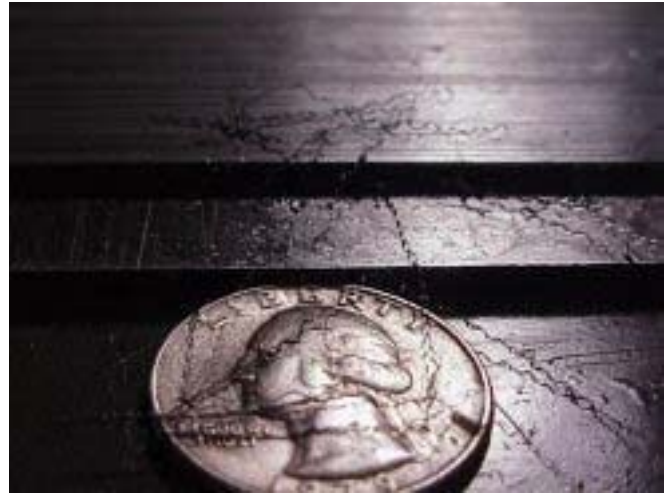
Finish Tool Right Front Photo by Pete Schaeffer

This is the same setup, but now we've moved to the right. You can see the curved edge and the angle at which it shears through the work. This photo makes it look as if I don't have enough front clearance on the blade. It turns out that that was the case. After regrinding, things went much better. It's a little hard to judge the angles when the cutting face is 25 degrees away from usual.



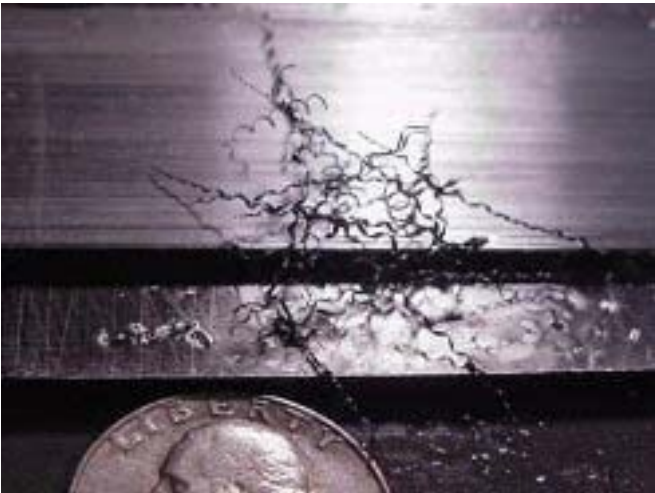
Finish Tool Front Photo by Pete Schaeffer

Same setup again, looking directly from the front. Notice that only a small part of the edge actually touches the work. This cutter is for light work: Moltrecht recommends 0.001" to 0.003" depth of cut.



Finish Tool 0.002 Depth Photo by Pete Schaeffer

Here are more chips from the finishing bit, this time with about 0.002" depth of cut and 0.002" feed per stroke. These are fine chips: a pile of them look like a Brillo steel wool pad. Be careful, they're sharp!



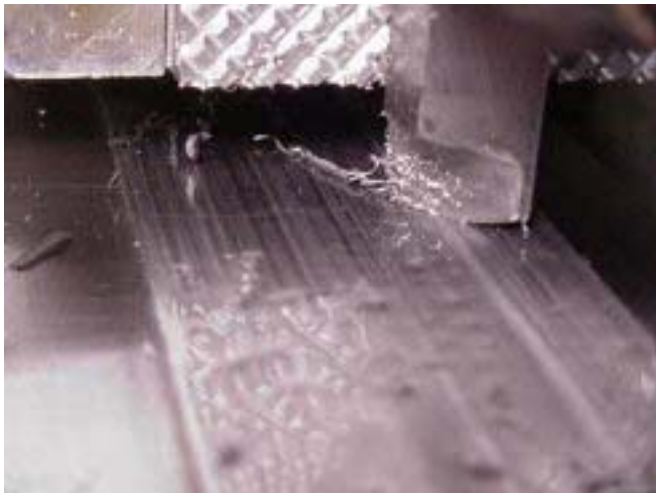
Finish Tool 0.004 Depth Photo by Pete Schaeffer

This photo shows some chips from the finishing cutter, with approximately 0.004" depth of cut and 0.004" feed per stroke.



Finish Tool 0.002 Depth2 Photo by Pete Schaeffer

This photo shows more chips with the same depth of cut and 0.006" feed per stroke.



Finish Tool Cutting Photo by Pete Schaeffer

This is a chip coming off the work. I think that this picture gives the best idea of how the finishing bit cuts. It's not at all hard to take 0.001" off the work with this bit."

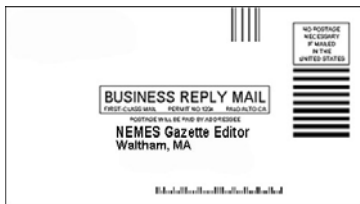
Thanks Pete, for that great contribution. Keep sending me letters and email with questions and interesting shaper stories. My mailing address is:

Kay R. Fisher
101 N. 38th St. #129
Mesa, AZ 85205

My e-mail address is:

KayFisher@att.net

Kay



Letters to the Editor

Support for the NEMES Model Show

As I write this, it's the Sunday before Christmas and our 2005 show is fast approaching. As I always do at this time of year, I am canvassing the organizations that have supported us in the past, soliciting new supporters and searching for door prizes for our show.

Unfortunately, in today's economy, commercial donors are not as readily available as they were a few years ago and prizes are harder to come by.

Many of the prizes we've awarded over the years have been contributed by our members themselves.

I'm going to spend some time in the shop later this week, looking for some item that would make a good prize, perhaps a tool I no longer use or a fixture I could duplicate as a prize.

I'd like to encourage other members to do the same. Prizes need not be new and need not be in pristine condition.

If you are going to make a contribution, please let me know in advance so I can have the appropriate documentation ready.

Steven S. Cushman
SCushman@compuserve.com

Puzzler

I can't resist sharing this little mind teaser. It stumped me. It requires thinking outside the box. No swimming by anyone or building of pontoons or islands is involved.

Question: The farmer has a fox, a bag of grain, and a rooster that he wants to ferry across a river. His boat is very small, and he has room only for himself and EITHER the fox, the grain, or the rooster. His problem is that if he leaves the combination of fox and rooster on either bank, the fox will kill the rooster. Or if he leaves the combination of rooster and grain on either bank, the rooster will eat the grain. How can he get all three across the river safely?

Answer: In next month's gazette.
(Hint: How do you make a flat surface using 3 stones?)

Rob McDougall



For Sale

Lathe

Monarch 10EE 10 x 30 lathe. Built in 1945 it still had the war production board finish. It includes a 3-jaw and 4-jaw chuck and has a taper attachment. The fellow selling it says it needs work. It has the motor-generator power supply and that isn't working. This is a candidate for a VFD drive. The lathe is on a trailer and the seller says delivery can be arranged at a reasonable rate. The asking price is \$500.00. Contact: Jay Wilkie at 278-748-1092 in South Berwick Maine. (Submitted by Dick Boucher)

Computer Monitor

For sale: Sony Trinitron 19-inch Flat Screen (not flat panel) Computer Monitor in perfect condition. Use this in your workshop for your computer or CNC machine to do shop CAD drawings, etc. I can bring it to a meeting for pickup. \$40.00 Contact Rob McDougall 781-647-0689.

Lathe

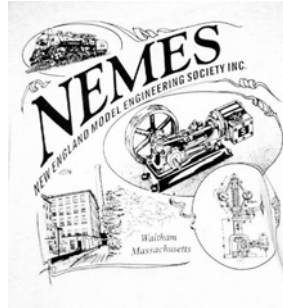
As many of you know, I'm moving to Colorado. I have a 8"x20" Prazi II lathe for sale. Like new condition sold with Chucks, quick-change tool post (AXA), and more. This is a benchtop lathe with electronic speed control, power feed, threading, and more. If you're interested, see <http://www.ismg4tools.com/d2400.html> for details. A steal at \$1300 or make me an offer. Don't wait I have to move SOON! Contact Steve Peters
E-mail: Steven.Peters@HP.com
Phone 508-842-2297

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. \$5.00 shipping included.

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



NEMES clothing

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. It is made from washable blue denim with 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:



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 wbrackett@rcn.com or (508) 393-6290

Calendar of Events

Jan 6th Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry 781-893-5410
Waltham, MA

Jan 15-16 Cabin Fever Expo
Bus trip info Norm Jones 978-256-9268
Show info 800-789-5068

Jan 29 9-5 and Jan 30 10-5
Big Railroad Hobby Show
Eastern States Expo
West Springfield Ma.
<http://www.amherstrail.org>

Feb 3rd Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry 781-893-5410
Waltham, MA

Feb 19th NEMES 9th Annual model engineering show
Charles River Museum of Industry 781-893-5410
Waltham, MA

Bill



Web Sites of Interest

This web site contains a searchable index of Model Engineering magazine and access to thousands of articles from the magazine in pdf format.

<http://www.iamnota.net/me/>