



The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 106

February 2005

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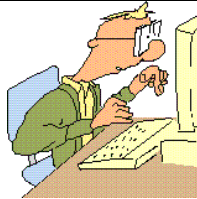
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Editor's Desk

Victor Kozakevich

I was doing some web research on do-it-yourself DROs last week and was amazed at how many people on the Internet have taken an interest in machine work. The existence of small, reasonably priced, Asian-made lathes and mills has made the hobby affordable and accessible to a large number of people. HSM readers often criticize the low quality and poor precision of these machines, but it seems there are plenty of people who are willing to deal with the limitations.

The most fascinating page I came across was by a jewelry designer who had converted an available Unimat lathe to CNC. He had added several rotary tables to it so he could sculpt rings in wax to produce investment castings. The task was outgrowing the machine, so he ended up gradually replacing everything but the headstock spindle. The ring design, cast in silver, was stunning. I can't wait to see what modelers will be able to do as the melding of computers, software and machine tools becomes more popular.

Next Meeting

Thursday, Feb 3, 2005

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 treasurer) 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

Norm Jones

The Meeting

Our speaker for the February meeting will be Jack Malcolm. Jack's subject will be the twenty-five year reign of the Dixie Lid Company and the byproduct that most of you probably know as the "Hoodsie" lid with the picture underneath. Jack has an extensive collection and will be giving a slide presentation. His talk should prove to be very entertaining.

Cabin Fever Expo Bus Trip Update

I believe that I can speak for all of you who went on the bus trip to York Pa. on the weekend of January 15-16, that we once again had a great time. I am composing this on January 21st with the threat of a major snowstorm forecast for this coming weekend. Timing is everything! Gary and Jared Schoenly have once again organized a terrific show. I especially enjoyed the chance to talk with many friends who I only get to see once or twice a year. There were countless opportunities to purchase tools, casting sets, books, etc. The cargo section of the bus was once again filled to capacity with newly acquired treasures on the way home.



NEMES Team Cabin Fever

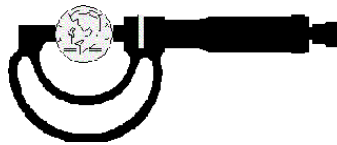
NEMES Model Engineering Show

It's time to think about our annual show at the Charles River Museum of Industry on Moody St Waltham Mass. on Saturday, February 19, 2005 from 10:00AM to 4:00PM. We will have compressed air available for running steam engines with 1/4" female shutoffs located at various intervals on a manifold. Bring a regulator to interface with your model. I encourage everyone to bring something to display. Photos, projects in progress, etc. are welcomed. This event represents one of our most significant contributions to the museum. Advertising of this event attracts a great many people that come to the museum for the first time.

NEMES members and non-members are welcome to exhibit. Setup time is at 8AM.

See you at the show

Norm



Treasurer's Report

Rob McDougall

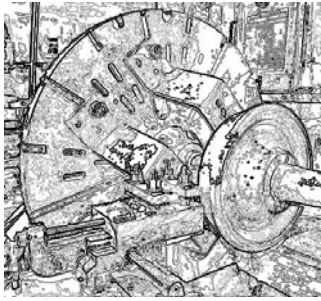
As of 12/31/2004

Balance as of: 11/30/2004	\$5,575.93
Dues Received	1,000.00
Cabin Fever Buffet tickets	362.25
Cabin Fever Bus tickets	2,500.00
Guest Speaker Fee	-50.00
Cabin Fever Bus Charter	-2,485.00
Bank Charge*	117.10
Balance as of: 12/31/2004	\$7,020.28

* Reversal of fees.

As of January 19th, 40 members have not renewed their membership for 2005. If you overlooked paying your dues, please give or send me a check for \$25.00, payable to "NEMES". I can take cash in a sealed self-addressed envelope. Please **do not give me cash in the hand** – I can't track it.

Rob



Rebuilding Old Iron

Project Bandsaw

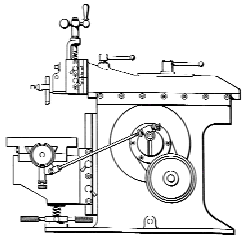
Last month's meeting was show and tell and I missed the meeting. But I couldn't bring my latest project in anyway. Several years ago I collected parts for a thirty-inch band saw. All these parts were pre 1900.

It was time to put this thing together. It needed a base to hold the bottom wheel and a motor. I started collecting 2" x 2" angle iron and did a few CAD drawings. I wanted to be able to move it around after it was built. My son had given me some six-inch casters, so I used them. I also thought it would be a good idea to have the bottom wheel in a well, isolated from the rest of the machine, and a connection for sawdust removal. I rolled up a ring to fit inside a four-inch hose and welded this in. I also made up a lifting wheel with a cam so when I moved it all I had to do was lower to wheel with an arm. It now stands 7' 8" tall. All the parts were cleaned and painted. The blade guides were rebuilt with new bearings. The wheels have new tires. All the Babbitt bearings were checked and cleaned, and new pulleys and shaft were installed.

The top blade and wheel housing was made from 1/2" square tube and expanded sheet steel. It sits on two pins and swings open to change the blade.

Rolly Evans





Shaper Column

Kay Fisher

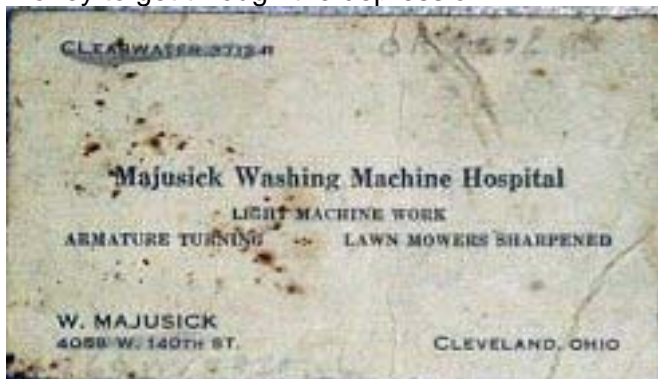
Shaper of the Month

This month's shaper story is from Mike Majusick in Centerville Ohio. This miniature (working) shaper was made by his grandfather (Walter Majusick) around the depression era.



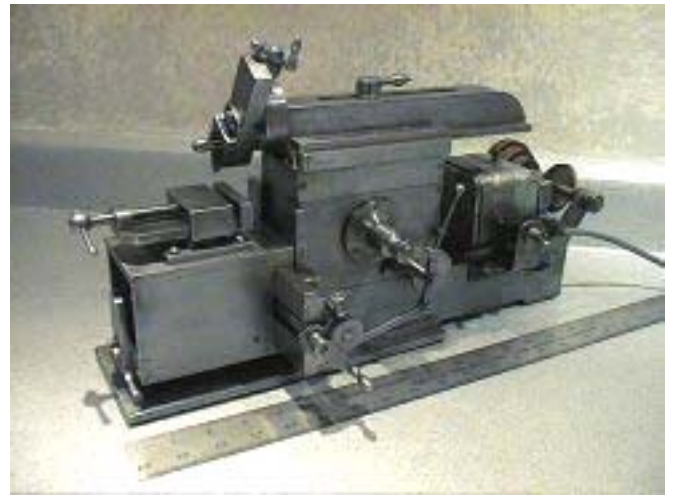
Shaper on Bridgeport Photo by Mike Majusick

The story is that he started a washing machine repair business using the shaper and a miniature lathe (which Mike has never seen) to help make money to get through the depression.



Business Card Photo by Mike Majusick

Mike found the business card pictured above in his old toolbox.



Right Side Photo by Mike Majusick

Mike's grandfather made the shaper and lathe strictly by hand. He hack-sawed all of the CRS material by hand. He drilled the holes with a hand drill. He didn't even have a drill press until he made one. He had a grinder that Mike's uncle (a retired tool maker) used to crank so he could sharpen his drills. He displayed these objects at a hobby show at a nearby high school.



Front View Photo by Mike Majusick

The shaper is fully functional, powered by an old sewing-machine motor. It has 6 speeds. Mike ran shapers in school and in his apprenticeship in the tool trade. He says this little shaper has every feature of the big ones. The table actually raises and automatically feeds from side to side in both directions. The stroke is also adjustable.

This little machine has a table cross-feed travel of 4", a table height adjustment of 2", and an adjustable ram stroke of up to 3". It uses a 90° gear reduction from its 0.7 amp sewing-machine motor to drive a three-step pulley on the RH side.



Right Side Details Photo by Mike Majusick

In the photo above, the lever near the rear is a two-speed gear change lever that increases the range to 6 speeds. The same photo shows a knob over the gear cluster on the left that, when rotated to engage gears, determines the direction of the automatic table feed.



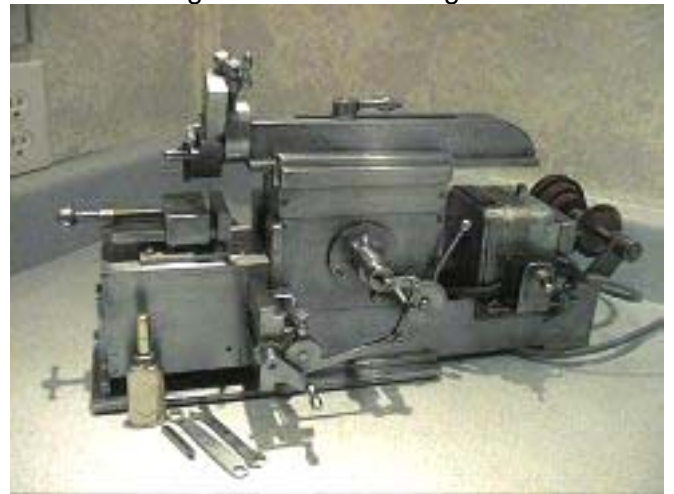
Left Side Photo by Mike Majusick

When the cover on the left hand side is removed, you can see the adjustment nut for the ram stroke, as shown in the photo below.



Stroke Adjust Access Photo by Mike Majusick

This shaper is small enough to fit inside of a box that is 19" long X 9" wide X 10" high.



Right Side with Oiler Photo by Mike Majusick

The two wrenches and sewing machine oiler shown in the photo above are original and stored under the vise.



Front View Photo by Mike Majusick

The toolbit down-feed mechanism is fully adjustable and rotates using radial t-slots similar to the setup on M-head Bridgeport mills. The vise also rotates.



Walter Majusick

Photo by Mike Majusick

Walter Majusick came to the US from Poland as a young boy. He had no formal education. He is credited with inventing many common items, the most familiar of which is the flaring tool used to flair the ends of tubing. He was in the military at the time and received no patent in accordance with the laws of the time. He was born in Stryj, Poland in 1896. He applied to Wright Patterson Air Force Base in Dayton Ohio for a position of tool, jig, and fixture maker in 1946 for \$1.45/hour. He listed patents and patents pending for a scrubbing and polishing machine and a strip of gang lights (later used in bomber aircraft). He listed his hobbies as "developing mechanical machines, steam engines, gas engines, electric generating units, and steam turbines." Mike has some of his engines too. He retired from the Fabrication and Maintenance Division as a master machinist and certified inventor in 1960, making \$3.49/hr.

The photo of him with his coworkers standing in front of their building at Wright Patterson Air Force Base prior to his retirement. He died in 1975. Mike inherited the shaper and will display it with his other collectible tools.

The photos of the shaper were taken on a bathroom countertop. Mike is willing to bet none of the members of NEMES has had a shaper in their bathroom yet!

Thanks Mike for that great shaper story. Keep sending me email with questions and interesting shaper stories.

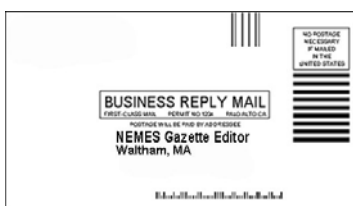
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Kay



Letters to the Editor

Unnecessarily Precise?

To restore one of my many GE Electrak electric lawn tractors, I needed a pair of seat hinge extenders. These are basically flat chunks of $1\frac{1}{8}$ " x $\frac{3}{16}$ " steel with a little shape and 3 holes. The thing comes under the heading of 'Gypsy auto body work' and 'caveman' technology.

Drilling the holes in the second part, I suddenly realized that I was doing something I have done since Jr. High School, but doing it differently. My procedure was as if this was holes drilled in an irreplaceable casting.

What happened to the caveman? What happened to the single hole done with a dime store electric drill? The walking center? The broken drills? The skinned knuckles?

Was this the passage of time? Was it black magic? It sure wasn't experience, as more experience in doing things wrong just makes one better at doing things the wrong way.

The answer, of course, is NEMES. I had acquired a small bunch of pretty good tooling before NEMES and learned how to do enough with it to satisfy my small needs and even to amaze myself and other people. But from its inception, NEMES has endeavored to be first in the one thing that any type of tool user needs the most, and that is education – especially that which comes from highly experienced people.

So the education made the difference. Doing even the simple jobs right by habit gives a satisfaction and a knowing that not only is the job done right, but more importantly, any help or mentoring given to other people doing the same operation will be done right.

Thank you NEMES. And thanks to the guys who took the time to share their knowledge. It couldn't have happened any other way.

Dave Robie

Answer to last month's brain teaser:

Trip 1: The farmer first takes the rooster across the river, leaving the grain safely with the fox.

Trip 2: Then he takes the fox across the river, but returns with the rooster. This leaves the fox alone on one side, the grain on the other side, and rooster in the boat with the farmer.

Trip 3: The farmer leaves the rooster and takes the grain. He then safely leaves the bag of grain on the far side of the river with the fox.

Trip 4: Finally the farmer takes the rooster back across the river to the waiting fox and bag of grain.

Rob



Time on

My Hands

Vic Kozakevich

How To *Not* Wind A Clock

I was in a conversation with someone at the Cabin Fever show and the subject of perpetual motion came up. Most inventors of such machines have unintentionally, or sometimes intentionally, incorporated some external energy source into the machine to keep it moving. It is just one of those topics that most of us enjoy, if only for the inspiring kind of faith it requires.

It struck me later though, that clock and watchmakers have been attempting and succeeding at certain forms of perpetually running machines for about a hundred years. Watchmakers realized a long time ago that motion imparted to a watch could be harnessed and used to wind the mainspring.

The first example, introduced in 1770, was a self-winding pocket watch. A weight inside the watch jumped up and down as the owner walked. The motion of the weight was used to wind the mainspring. At the time, the demand was to do away with the need to open the watchcase and wind the mainspring with a tiny key. This first self-winding watch was not particularly successful, as pocket watches tend to sit in the same position in

the wearer's pocket, so it took a lot of walking to wind the watch. Crown or "keyless" winding was introduced in the 1850's and people just accepted the daily ritual of winding their pocket watch.

When the wristwatch became popular after the first World War, several new self-wind or "autowind" mechanisms evolved. The system that took hold was a weight that pivoted at the center of the back plate of the movement and wound the mainspring through a gear reduction and ratchet wheel mechanism. A slip clutch, called a "bridle", at the outer end of the mainspring prevents over winding. Some systems wind in one direction of rotation, some in either direction. In 1948, the Eterna Company of Switzerland added a tiny ball bearing race at the pivot. The balls are about the size of a ball point pen tip. A few higher-grade autowinds include an indicator to tell the wearer how many hours of run time are stored in the mainspring. Since today's owners often own more than one watch, it became necessary to invent a motorized winder for autowind watches, so that the watches not being worn would continue to show the correct time and date. It is just a watch holder hooked to a geared down motor that rotates the watch. This is also great for those who don't get enough exercise to wind their watch!

As the quartz oscillator and stepper motor has largely replaced the watch mechanism, several manufacturers have come up with ways to eliminate battery changes. The simplest one is the Citizen *Ecodrive*, with a solar cell behind the dial charging a lithium-ion battery. Seiko offers the *Kinetic*, with a rotating autowind weight geared to a tiny generator to charge the battery. The Swiss created a version as well, and call it *Autoquartz*. Seiko has since created yet another version, called *Spring Drive*. It's something of a regression, as it is a quartz watch powered by a mainspring! The mainspring, through the time geartrain, drives a generator. As the generator spins and voltage builds, the electronics take over and regulate the speed of the generator to serve as an electronic escapement. The outwardly distinguishing feature of the watch is that the second hand moves smoothly, rather than with the one-second steps of an ordinary quartz watch.

As clocks don't move, their makers found other approaches to alternative power. A highly regarded maker of conservatively designed

watches in Switzerland, Patek-Philippe, back in 1950, produced a simple but very efficient example. The case had a solar cell mounted on top, which charged up a battery inside. The eighteen-jewel movement is similar to that of a wind-up pocket watch. A motor wound the movement's mainspring and a switch in the movement turned on the motor when the spring had run down a half-turn and turned it off when the spring was fully wound. It's nothing really high-tech mechanically, but probably one of the few consumer applications of a solar cell in 1950.

The most successful self-winding clock has to be the *Atmos*, a product of Jaeger-LeCoultre of Switzerland. In the late 1920s, the makers managed to harness the energy of subtle changes in room air temperature. The "motor" of the system is a metal bellows filled with ethylene chloride gas. This gas has a high coefficient of expansion, so small changes in temperature cause a significant volume change. The bellows,



Atmos bellows

four inches in diameter, is counteracted by a three inch diameter coil spring. These two parts are compressed into a cup at the back of the movement and retained by a cover with a hole in the center. A small chain is attached to the front of the bellows and the other end attached to a ratchet wheel in the clock movement. The chain and ratchet wheel work like the recoil starter on a lawn mower, and winds the mainspring as the bellows expand and contract. A one-degree temperature change can run the clock for two days.

The movement resembles that of a pocket watch and has a jewel bearing for every pivot. The manufacturer states that the movement runs without oil. Rather than a balance wheel, the oscillator is a "torsion pendulum", similar to the 400 day/anniversary clocks produced in Germany in the 1950s and 1960s. The pendulum is a 3" diameter ring whose crossbar is suspended by a thin piece of flat steel wire. The wire's alloy has a high nickel content with a near zero coefficient of expansion, so the length does not vary with temperature and change the clock's rate. The pendulum rotates first to the left and then to the right, taking a minute per revolution. When the mainspring is fully wound it can run the clock for a year without any further changes in temperature.

So, perpetual motion can be achieved. You just have to believe.



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. \$5.00 shipping included.

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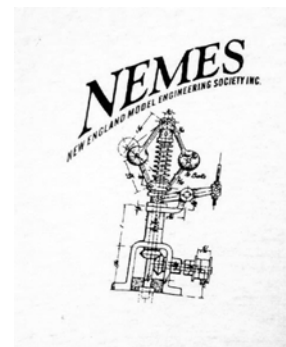
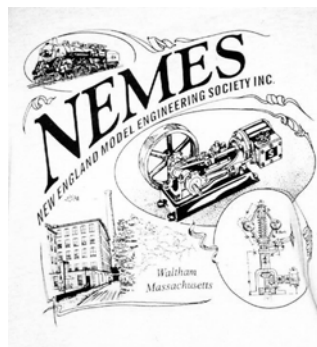


NEMES clothing

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

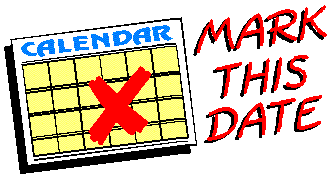
Prices:

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

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

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

March 4th 8:30AM-5:00PM, March 5th 8:30AM-4:00PM
2005 FIRST Robotics Competition Regional Events
Verizon Wireless Arena
555 Elm Street
Manchester, NH
<http://www.baesystemsfirst.org/regional/schedule.htm>

Bill