

# The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 114

October 2005

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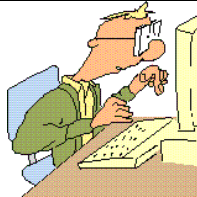
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## Editor's Desk

Victor Kozakevich

The "In the News" section of this month's Gazette describes a new IC engine design being promoted by a family here in Massachusetts. In these times of rising fuel prices, any improvement would be welcomed.

It did strike me that there are quite a number of IC engine designs around, each with advantages and disadvantages. For example, Toyota claims that the engine in its Prius hybrid is an Atkinson, but someone in a forum countered that it's really a Miller cycle engine, as it uses a conventional bottom end rather than the double link rod of the Atkinson.

All this makes me realize this is an opportunity for the IC engine experts among the NEMES members to get together, cut through the confusion, and offer a presentation on some of the lesser-known designs. Any takers?

Also, look for Mike Boucher's story on introducing a new modeler to the hobby. Thanks Mike.

## Next Meeting

Thursday, Oct. 6, 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 membership secretary) for the calendar year are due by December 31<sup>st</sup> 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**

At the October meeting, Ron Ginger will talk about his boat trip this past spring. He traveled through 3 major canals, The Rideau, The Trent-Severn and The Erie, a total of over 125 locks, and a total distance of over 2100 miles.

The talk will describe the locks and some of the interesting machinery involved in them. This ranges from the Rideau Locks, still operating exactly as they were built in 1826-32, to the Erie Canal locks of the early 1900s. Included will be some very detailed photos and a description of the famous lift lock in Peterborough Ontario, a hydraulic lift that raises boats 69 feet, built in 1904. There will also be photos of a marine railway that lifts a dozen boats at once over a 50 foot ridge.

### **Group Field Trip**

Fellow member Jim MacDonald had occasion to visit The New England Sculpture Service Co in Chelsea Mass to have some lost wax casting work done recently. He asked about the possibility of a guided tour of the facility and consequently we are invited to meet at that location on Tuesday October 18 at 9:00 AM. I will have a sign up list at the October meeting along with directions on how to get there. Please either sign up at the meeting or call me at (978) 256-9268 to let me know if you are going on the tour. Further information is available at their web site:

[www.nesculpture.com](http://www.nesculpture.com).

Thanks Jim for inquiring!

### **Membership List**

It has been some time now since we have published a membership list. The intent is to include a list of current members as part of a future issue of the Gazette. This list will not be included in the on-line version of the Gazette that is accessible through our web site. If you

do not wish to have your name included in the printing, please notify me.

### **Lee's Mills Steamboat Meet**

Les Russell and I ventured north to Lake Winnepesaukee to attend the annual Lee's Mills Steamboat Meet. On Monday morning we were treated to a ride with fellow member Russ Steeves, on "Redbud". Thanks Russ! The following picture was taken during the parade on Sunday morning.



Monday afternoon, Russ and I went for a ride with Maurice and Mary Coleman from Lexington South Carolina on the "Queen Mary II". I was invited to steer the boat for a while with Mary's expert navigational assistance. I found that feeding the boiler from time to time goes along with steering! Their boat has a unique accessory: a deck mounted cannon. Check it out in the following picture.



I went out on the "Queen Mary II" once again on Wednesday morning. I got to steer again as well. It was a little foggy on the way to 19-mile pier in Tuftonboro, but the weather was picture perfect for the return trip in the afternoon. The "Queen Mary II" made a speedy return from Tuftonboro. Maurice says that he likes to go fast at least once during the

meet. I was able to get some great pictures as we passed everything in sight (having started out from the back of the pack). Thanks to Maurice and Mary for two great rides. The following picture is of the engine in their boat.



The grand finale took place on Sunday morning at around 10:00 AM: a parade of steamboats that was as popular with the participants as it was with the spectators lining our route. My wife Leslie and I were on board the Lady Gayle owned by Clarence and Gayle Myers of Perrysburg Ohio. I have known Clarence and Gayle for a good many years through their association with the NAMES show previously held in Detroit Michigan. The NAMES show will be moving to Seagate Convention Centre in Toledo Ohio on April 22-23 2006. They are very excited about this spacious new show site. I have a good supply of show flyers for all who are interested in attending the event. They will be available at the next meeting. The following picture is of the Lady Gayle and was taken on Wednesday as she was departing the Tuftonboro area. Thanks again to Clarence and Gayle for a most enjoyable ride.



### **American Precision Museum Show**

Don't forget that the APM show comes up on October 29 at the Windsor Community Center (same location as last year) in Windsor Vermont.

See you on October 6.

*Norm*



### ***The Meeting***

Max ben-Aaron

### **September Meeting**

The September meeting was opened by Venerable President Norm Jones in the Jackson Room of the Charles River Museum of Industry.

“Some of you may recall that I asked for suggestions for future topics that might be of interest to the group. Tonight’s talk is intended to help those of you who are just getting started in the machining hobby as well as to inspire interaction within the group as to how some of the more experienced hobbyists have addressed challenging problems.”

The main topic of the night was a talk and slide show on work-holding methods for the lathe by Norm Jones. This was in response to the changes

observed in the membership over the years. Many, if not most of the original NEMES members were already well-versed in model-making, but, over time, we are attracting less experienced members, so it is appropriate for NEMES to don the schoolmaster's gown and help to educate them in the niceties of metalworking.

Norm covered the use of chucks - both three-jaw, self-centering - and the universal four-jaw variety, as well as face-plates and collets. *If you go to the NEMES website, you can see Norm's pictures by looking for 'September 2005'.*

Norm's talk was supplemented by remarks from Rollie Gaucher, as detailed in "Show & Tell".

### Show & Tell

Rollie Gaucher bought a small Chinese lathe for his grandson to introduce him to the joys of turning. The tailstock clamp was awkward and inefficient, so Rollie showed how he re-engineered it to have an eccentric clamp. Usually, tailstocks of this type only have one bearing, which limits their effectiveness, so he added an outboard support and bearing. Also the clamping plate on the bottom was a flat piece of steel that would not maintain orientation, so he made a new plate that tracks the underside of the bed. Rollie says that Atlas and Southbend lathes would benefit from this same tailstock modification.



To supplement Norm Jones' talk, Rollie showed how he built a fixture with a freely-rotating spindle which carries a nosepiece that matches the nose of his lathe. The spindle is mounted on a T-section aluminum extrusion, to hold the faceplate horizontal in a vise while the workpiece is being clamped to it. The fixture can then be rotated in the vise so the faceplate can spin in a vertical plane so the assembly can be balanced. Two spindles are shown in the picture, one for Rollie's Clausing lathe.



Another picture shows a movable v-block that is fixed to the faceplate. The v-block slides up and down, constrained by the slot and ways on either side. This is useful for mounting the shaft of a crankshaft eccentrically to machine the throws.



The indexing fixture is needed to index a workpieces with multi-start threads. To make a triple-start thread, for example, after the first thread is cut, the work-piece is indexed by 120° to cut the second thread and then again by 120° for the third. The relative relationships between the spindle and the

lead-screw have to be preserved for each operation - only the work-piece needs to move.



Henry Szostek brought in his unique (and beautifully machined) air pistol (under construction) that is designed to overcome a problem that besets traditional air pistols, in which the gun is cocked by compressing a spring. When the trigger releases the spring, it drives a piston to compress the air that will drive the pellet. As the piston approaches the end of its travel, there is a spike in the pressure that stops the piston and bounces it backwards a bit, limiting the pressure, so the impetus transferred to the pellet is abruptly cut off and it (the pellet) coasts the rest of the way down the barrel. Because of the pressure spike, only 30% of the energy stored in the cocked spring propels the pellet.



Henry's pistol is engineered to overcome this by incorporating a secondary piston of smaller diameter (and, hence, smaller area) that is pre-

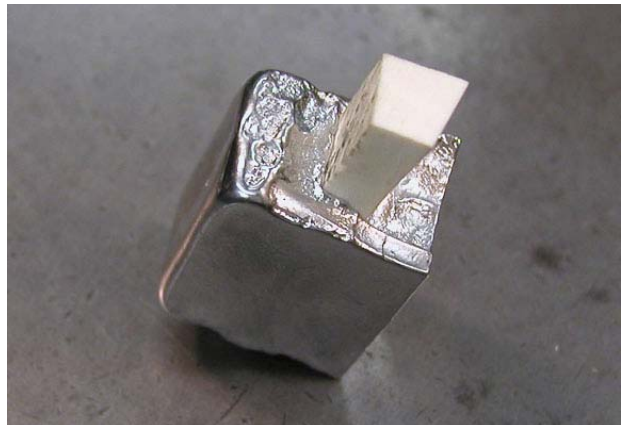
charged by the main piston. When the main piston, almost at the end of its travel, touches the smaller piston, the first part of the movement,  $\frac{1}{8}$ ", closes the passage between the large and the small piston, capturing the air charge in the smaller area piston, which is being acted upon by the spring and the momentum of the main piston, keeping the pressure up and transferring more energy to the pellet.

This seems to be a brilliant solution to the problem. We wait for the experimental proof of the concept.

Frank Dorion has an antique carpenters rule (from the days when tools were made by jewelers and instrument makers, rather than industrial slaves) which is missing an ivory insert. The odd shape of the insert made it a challenge to hold the piece while it was being shaped. Frank solved the problem by making a fixture using Cerrolow 117.

Cerrolow 117 has the lowest melting temperature in this family of alloys (and, unfortunately, the highest price as shown in the MSC catalog). Price drops off rapidly as the melting point goes up. Fortunately, Frank found some at \$2 per ingot, at the Pratt & Whitney surplus store few years ago.

Frank added: "All in all, these low-melting temp alloys offer some great solutions to machining and bending problems, and in some cases, may be the only solution. Just one caution I would pass on that is only addressed obliquely in the literature.

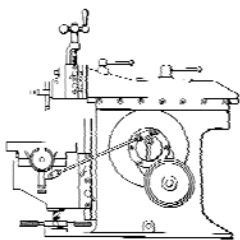


Rolly Gaucher asked if these molten alloys would "wet" the material immersed in them in the same sense that solder "wets" a well-prepared joint. I wasn't sure of my answer to his question at the time, but now believe in some cases that "wetting" can happen – aluminum is mentioned as one metal that

will combine readily with molten Cerrolow. In any case, a test piece is recommended before you immerse that irreplaceable item in molten Cerrolow. Parting agents like a coating of oil apparently can be used to avoid bonding.

Another important caution is to avoid overheating these alloys – no open flame on them! Melting in a water bath seems the preferred method to avoid whiffing nasty heavy metal fumes from the overheated metal.”

Max



## ***Shaper Column***

Kay Fisher

### ***Lewis Shaper***

My first shaper was a Lewis. I obtained it by trading a mini lathe with fellow NEMES member Howard Evers. Howard had cleaned it up and aligned everything, so there was nothing for me to do but use it. Lewis shapers are not hard to find but it is hard to find two that look alike. They were sold as plans and casting kits, and many were made by students in trade schools.

The Lewis is billed as a 10 inch shaper but you would be hard pressed to actually cut a 10 inch piece with it; closer to 9 inches is all mine can handle. None the less, I was in the shop one night when I had 3 shapers. I was building tool holders for a lathe and thought it would be cool to have all three shapers running at the same time. After futzing with the 7 inch Logan and 7 inch Rhodes for a few minutes I gave up on the idea because the vice of the Lewis held twice as many tool holders as the Logan or Rhodes.

This month's shaper acquisition and refinish story comes from Mike Unger in Gloucester Point Virginia. After his refinishing job I can say that Mike's shaper puts mine to shame.

"I got into machining so I could fabricate parts for my hobby of racing vintage sports cars.



Mikes Hobby

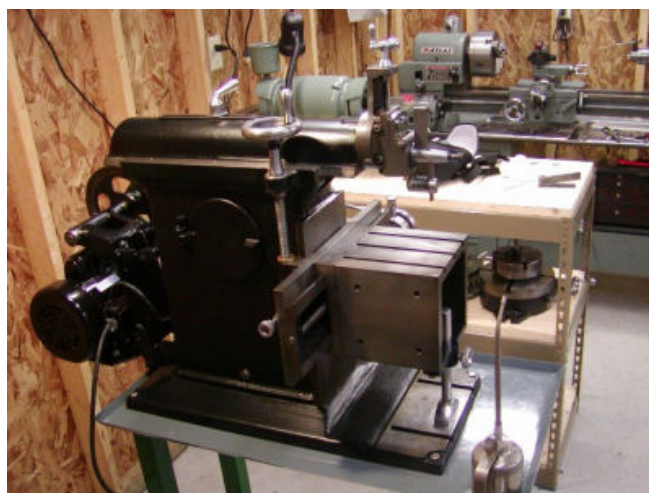
Photo by Ken Moore

My enjoyment and interest in machining has grown to the point that it is now a second hobby. I bought my Lewis at an estate auction for \$95.00. It's a pretty funny story now that I think about it.



Lewis Side View

Photo by Mike Unger



Lewis Side View 2

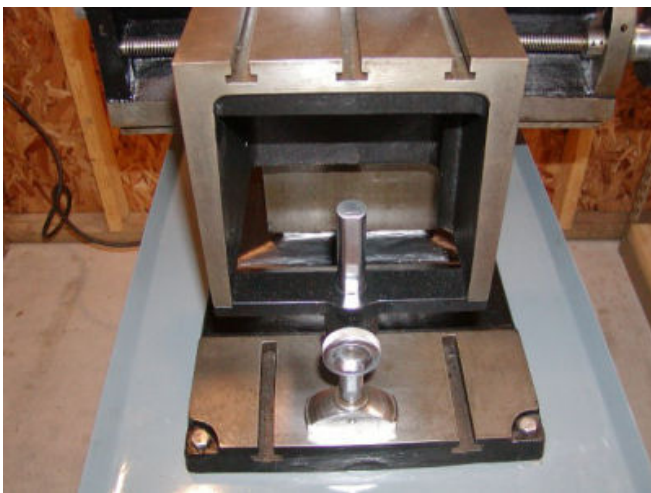
Photo by Mike Unger

I was always intrigued by shapers and when I saw this one at the auction I thought it looked great, needed a home and I felt I had to bid on it, if it wasn't too much. I really hadn't planned on any big purchases. I was surprised to get it for less than \$100.



**Lewis Motor Mount** Photo by Mike Unger

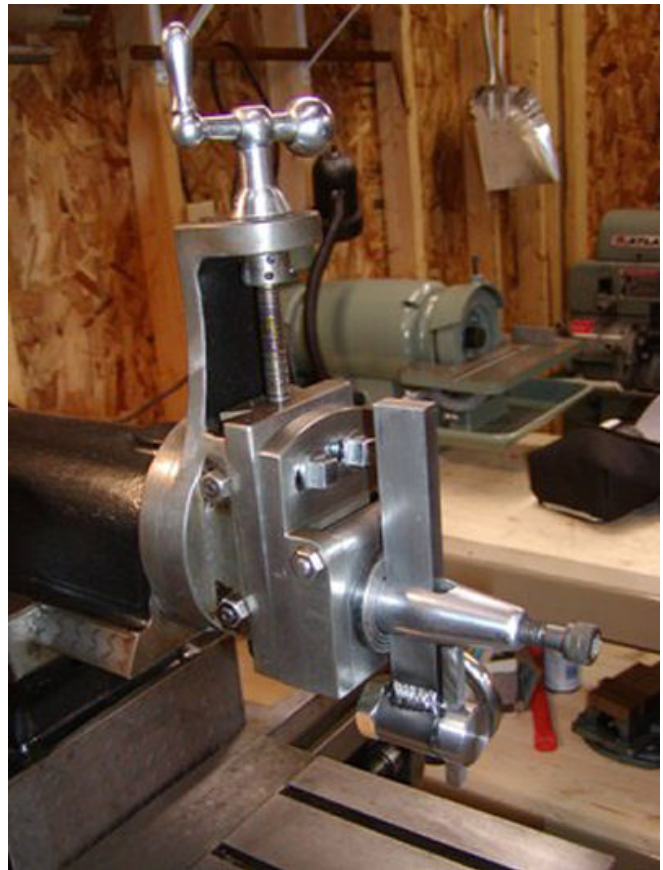
I had to call my significant other to rescue me with some tools and a hand truck so we could take it apart into small enough pieces to lift into the back of my truck.



**Lewis Support Bracket** Photo by Mike Unger

It was bolted to the same welded 2-inch square tubing stand that it is mounted on today. Luckily, Ellen was home and was willing to

come to the rescue! I looked around the auction and found the biggest guy who wasn't bidding on anything to help me lift the pieces into the truck. Once home I was able to lift the shaper from my truck with my engine lift.

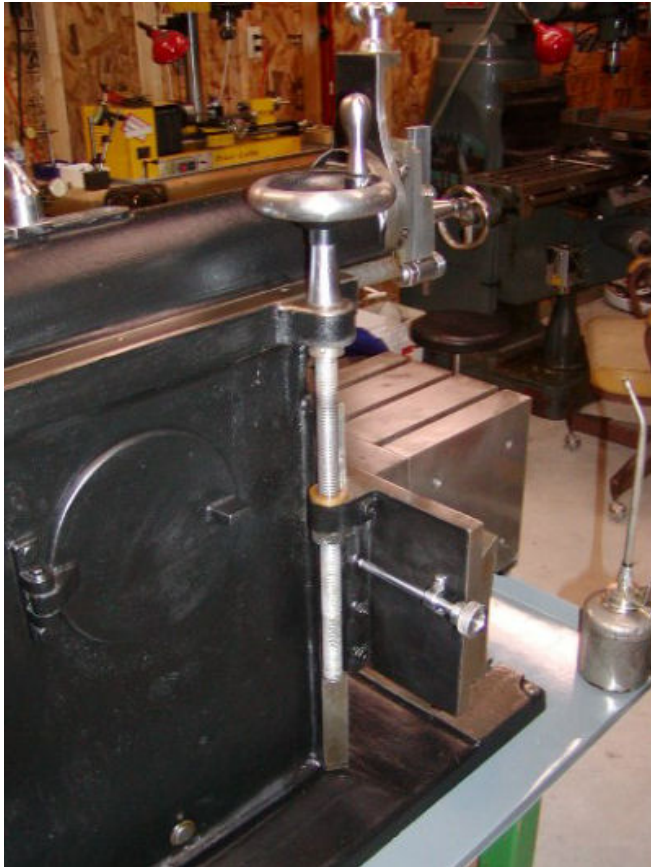


**Lewis Tool Post** Photo by Mike Unger

It was originally black and most of the non-painted surfaces were brown. Once home, I did some internet searching and learned I had purchased a Lewis shaper. I also learned that they were assembled from casting kits so fit and finish was function of the builders' skill or care. A couple of evenings with some kerosene, a paint brush and some fine Scotch-Brite™ and I was delighted to find the shaper in excellent condition. The brown was mostly a layer of very old dried oil that protected the surfaces of the machine.

I also discovered that the builder was a skilled machinist. The ways and flat surfaces were all hand scraped and there were detailed features like: multiple T slots and mounting holes in the table, beautifully machined cast-iron pulleys, a cam locking backpack style adjustable motor mount (no motor), a table support, a locking knob for the vertical gib, a locking screw for the clapper, chromed fittings, oil

cups, and oiling grooves machined into every possible bearing surface.



**Lewis Table Lock** Photo by Mike Unger

It must have been someone's pride and joy. Something about the care that went into building the machine made it feel more special to me than a commercially made tool.

Once cleaned, I oiled all the ways and bushings and painted the black surfaces with PPG black epoxy. This paint is very durable and has a semi gloss look which I prefer for this machine as it looks more "vintage" to me than a high gloss. I added a 1/2 horse motor and wired it so the forward stroke was "over the top", something I learned from Kay's shaper column! I also added a chip and drip pan that fits between the shaper and the stand. I made an adjustable tool holder based on Art Voltz's excellent plans and made my first chips last weekend.

[The tool holder drawings made by Art Volz are posted on the web at the Yahoo Metal\_Shapers group:  
[http://groups.yahoo.com/group/Metal\\_Shapers](http://groups.yahoo.com/group/Metal_Shapers)

The drawings are in the Files section (membership required) as holder1.jpg and holder2.jpg

This little shaper will bring me many years of enjoyment. I somehow doubt the original builder is still around but I hope he's smiling somewhere knowing that his hard work is appreciated and preserved."

Thanks Mike for that great story about one of my favorite shapers.

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

[KayPatFisher@Yahoo.com](mailto:KayPatFisher@Yahoo.com)

Kay



## ***Building a New Modeler***

Mike Boucher

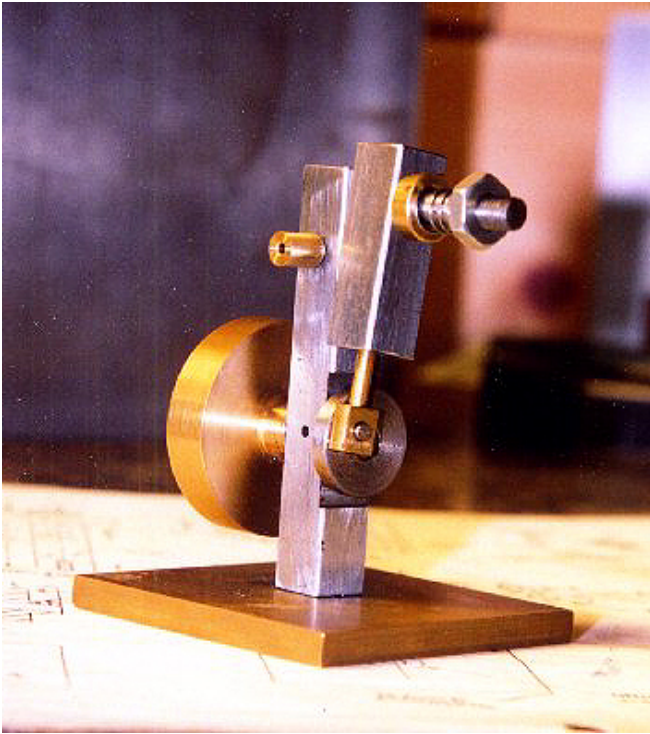
### **Frank's Engine**

Live Steam magazine has a saying: "Each one, Teach one", to encourage Live Steamers to teach the next generation. I have a 16 year old nephew, Frank, who lives in southern NJ. A few years ago, he came up to visit my wife, Karen, and me for a week over the summer. Karen and I took him to the Waushakum Live Steamers for a run day. Frank was really fascinated with it, especially after I let him run my engine. He now wants a lathe and mill so he can build models for himself.

He visited again at Christmas of 2004, and I thought it would be fun for both of us if he learned a bit of model engineering.

A simple single-cylinder, single-acting, oscillating steam engine was the first thing I built, and I figured that would be a good project for Frank. I had a set of plans that I photocopied out of a metal shop project book back when I was in high school. The engine is about 2.5" tall overall with a 1/4" bore by 3/8" stroke and a 1" diameter flywheel. The pivot point is at the top of cylinder block.





To show him the basics, and explain how the machines work, I built a couple of parts first, the flywheel using the lathe, and the base using the mill.

After each part was finished, I had Frank machine his own part, with me watching carefully and giving him instruction. Building the flywheel, Frank learned the basics of facing, turning to diameter, and drilling with the tailstock. Building the base, he learned edge finder operation, milling the edge flat and square, and drilling with the quill. He also learned a little bit about laying out the parts and center punching before machining.

The next part made was the crankshaft. We used the 4-jaw chuck in lathe and my "Kozo style" wobbler center finder to find the location of the crankpin hole in the crank disk. Then the main shaft and crankpin were press fits in the crank disk.

The body was the next piece we made. This part was more involved than the previous parts, so Frank learned a lot more about laying out and milling machine work. I did the actual layout work, as I have a vernier height gauge, which can be a challenge to read for the novice. I did show him how to read it, and Frank would do the math to tell me where to set the height (the plans are in fractions and

some dimensions are derived). As I set the height gauge, I had Frank read the vernier to confirm that I set it correctly.

Frank learned how to use the mill to cut a slot in the surface of a piece. We used a reamer for the crankshaft bearing through the body. This gave a smooth, close tolerance hole for the crankshaft.

The trickiest operation in the body was drilling the inlet port, as it takes a 90° turn in the middle of the part. Frank learned to drill the hole only part way in from the front, and then accurately locate the hole on the left side, and drilling part way in to complete the inlet.

We made a slight change in the plans here. The instructions said to take a needle valve, the type used to inflate a football, and solder it into the inlet port. I had Frank drill and tap a hole, and we made an inlet port which we could slide a piece of ¼" tubing onto.

A nut retains the spring on the shaft which the cylinder oscillates on, and that shaft is a press fit in the body. We cut a thread in the lathe, using a die and my tailstock die holder, and then pressed the shaft into the body.

The week was over and Frank had to go back home. He had gotten far enough that he could flip the flywheel and watch the crankshaft spin, but it needs more work. We said he could come back up over the summer, provided he did well in school.

The last week of this August (2005), Frank came back up for both my son's and wife's birthday party, and stayed for the week so he could go to the Waushakum annual meet. He finished the project by building the cylinder, piston, and the spring.

The cylinder was the first piece that required operations in both the lathe and mill. We used the 4 jaw and center finder to drill and ream the cylinder bore itself, then moved to the mill to locate the steam port and pivot hole.

The piston turned out to be the most challenging part. It's a one-piece piston, connecting rod, and main bearing. It was mostly lathe work, but did need milling to make the bearing end both flat and the correct thickness so it wouldn't foul the crankshaft. Frank had to machine both sides of a round piece using a square collet holder in the milling machine vise. He also learned about cutting with a right handed cutting tool in lathe.



The first attempt ended in disaster! While turning the “connecting rod” section down to size (.093” from .250” stock), he moved the carriage a little too far. We suddenly had an intermittent cut, the tool caught an edge and the .093” diameter brass wasn’t strong enough to handle the force. The piece snapped in half. That got Frank a little discouraged. I showed him that it took me 3 tries to get the crankshaft right on my PM Research #5 engine, and that helped.

Our second attempt worked much better, due to a better order of operation, and we set the indicator so he would know when to stop.

Frank even wound the spring by hand, using .015 piano wire and a simple jig chucked in the lathe.

The total build time was about 15 hours.

When we first ran the engine, it was a little tight, and needed 35 psi to run. After 5 minutes of break in time, it was running like a hummingbird on 15 psi.

“Each one Teach one”. I’m glad I’ve had the opportunity to do just that. Frank now has a steam engine that he built for himself. He’s also learned some basic machine shop skills, like reading a micrometer and dial caliper, lathe and milling machine operation, and laying out parts. Seeing the smile on his face when the engine first ran was all the thanks I needed...



Frank left with two more sets of plans, one for a simple two-cylinder, single-acting engine with a scotch yoke for the connecting rod and valve rod, (plans off the internet) and the other for an Elmer Verburg designed mill engine, from Modeltec Magazine. Next time he visits, we may start working on the scotch yoke engine.

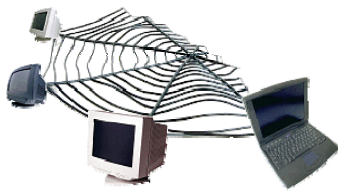
I’ll end with a plea: Frank lives in Berlin, NJ (20 miles or so from Philly). If anyone knows a model engineer in his area, who would be willing to have an “apprentice”, please contact me. I’m sure Frank would love to have a mentor who’s a little closer than 300 miles away.



## ***Treasurer's Report***

Dick Koolish

Income	
Sales of two aprons	50.00
Expenses	
September gazette	160.90
Purchase of video projector, CD player and video camera	915.69
Checking account balance (9/20/05)	6648.38



## ***Web Sites of Interest***

Sign up for the NEMES mailing list at:  
<http://groups.yahoo.com/group/nemes>

See how a dragline mining machine is constructed. Includes a large scale automated welding system.

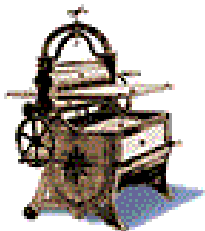
[http://www.minepro.com/dragline\\_erection/estevan.html](http://www.minepro.com/dragline_erection/estevan.html)

Behold the buscycle, the ultimate gas saver!  
 Built right here in Massachusetts.

<http://www.busycle.com/>

The Double Scotch (it's an engine! - drawings included)

<http://www.homemetalsclub.org/projects/scotchx2/scotchx2.html>



## ***NEMES Gazette Editorial Schedule 2005-2006***

Here are the closing dates for Gazette written contributions in the coming months:

<u>Issue</u>	<u>closing date for contributions</u>
November	10/21/2005
December	11/18/2005
January	12/23/2005
February	1/20/2006
March	2/17/2006
April	3/24/2006
May	4/21/2006
June	5/19/2006

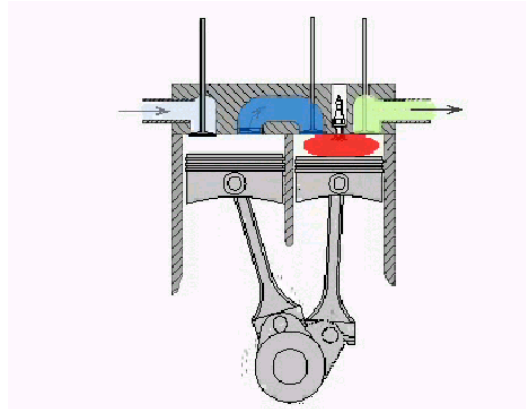


## ***In the News***

### **Massachusetts Family Has New Engine Design**

The Scuderi brothers of West Springfield, MA are promoting what could be the first major advance for the internal combustion engine in nearly a hundred years. The design, originated by their father, splits the four cycles of a conventional engine between two cylinders. The brothers used computer models to demonstrate as much as 30 percent efficiency improvement over conventional four-cycle engines.

In the diagram, the left cylinder does intake and compression, the right cylinder does power and exhaust. A transfer port connects the two cylinders, allowing compression of the left cylinder to enter the intake of the right. The compressed charge enters the power cylinder at about 20 degrees after top dead center. The advantage claimed is that this reduces the peak cylinder temperature, and practically eliminates the formation of oxides of nitrogen (NOX).



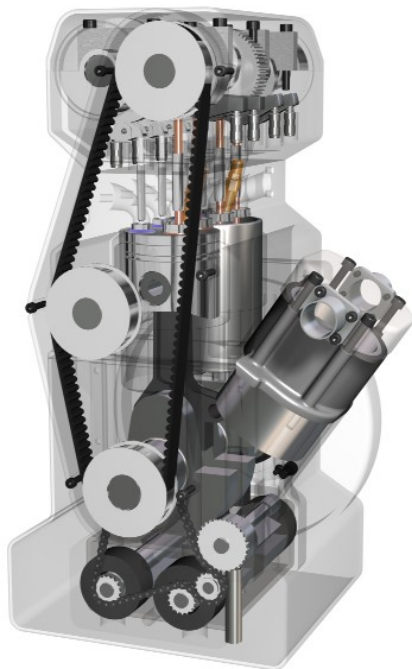
Another advantage, according to the inventors, is that the two-cylinder design allows each cylinder to have the optimum combination of bore, stroke and valve timing. If you go to the brother's website and watch the animation, the design appears, at the core, to be a piston-supercharged two stroke, using poppet valves rather than cylinder wall ports. Blower supercharged two-stroke diesels are somewhat

common, but here, compression occurs outside the power cylinder.

The Scuderi Engine animation page is:  
<http://www.scuderigroup.com/video.htm>

An article about the Scuderi from South African Popular Mechanics magazine is at:  
<http://pscuderi.homedns.org/scuderi%20engine-za.pdf>

Another company, this one in Finland, is offering a piston-scavenged engine, a two stroke diesel with high turbulence combustion chamber. An external turbocharger is fitted. Aumet Oy claims the computer models of its "Z-engine" show it capable of achieving an overall efficiency of 45-48%, a 30% improvement over the typical 30-35% efficiency of a four stroke.



The Z-engine home page is:  
<http://www.aumet.fi/>

An article describing the Z-engine is at:  
<http://www.fisita.com/publications/autotechnology/04.pdf>

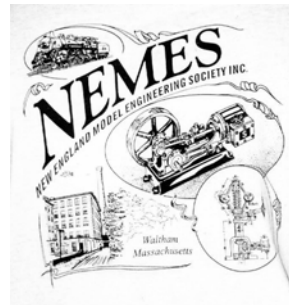


***For Sale***

### ***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.

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Preston, CT 06365 8206  
[errol.groff@snet.net](mailto:errol.groff@snet.net)

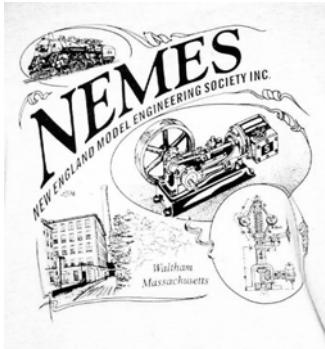


***NEMES clothing***

### ***NEMES Tee Shirts***

NEMES tee shirts and sweatshirts 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 sweatshirts are the same color, but long sleeve and a crew neck. Also 50-50, but these are by Lee. The sweatshirts 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. Sweatshirts are \$7 for shipping the first, and \$1.50 for each additional sweatshirt.

Profits go to the club treasury.

Mike Boucher  
 10 May's Field Rd  
 Lunenburg, MA 01462-1263  
[mdbouch@hotmail.com](mailto:mdbouch@hotmail.com)

***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

***Lathe for Sale***

Sheldon lathe 9" x 36" with legs. No chucks or collets. Quick-change gears, taper attachment, Single-phase motor. It's available now (i.e. could be free)

Call Don Strang 978-456-3611



**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 [wbracket@rcn.com](mailto:wbracket@rcn.com) or (508) 393-6290.

*Bill*

Oct 1-2 Water's Farm Days Show  
Exit 4 (Sutton) from I-395 4 miles to Douglas Rd. Right after church then left on Waters Rd. W. Sutton, MA  
Butch 508-235-5035

Oct 1 9AM-4PM Yankee Steam Up  
New England Wireless & Steam Museum  
1300 Frenchtown Rd.  
<http://users.ids.net/~newsm>  
East Greenwich, RI 401-885-0545

Oct 2 Noon- 5:00PM  
Roland's shop visit  
90 S. Spencer Rd; Spencer MA  
508-885-2277

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

Oct 9 Owls Head Transportation Museum  
Foreign Auto Festival & Antique Aeroplane Show

Oct 17 MIT Flea Market  
Albany Street Garage, Cambridge MA

Oct 29 APM Model Show  
American Precision Museum Windsor, VT  
802-674-5781

Oct 30 Owls Head Transportation Museum  
The Great Fall Auction & Open House

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