

The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 140

December 2007

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Editor's Desk

Victor Kozakevich

A few months ago, I saw an article about cooking stoves for Darfur, and it led me to more curiosity about appropriate technology efforts for use in the Third World.

The latest one I came across is one from a familiar name, Dean Kamen. His company, among others, is looking into small electric generators that can be powered by a variety of non-petroleum fuels. One article said that 25% of the world's population has never used electricity; the grid just doesn't go that far.

Kamen's generator is based on a Stirling cycle engine and is intended to power a water purifying system that uses UV light to kill germs. The electricity produced can have other uses like charging cell phones, or running one of those \$100 laptops.

While ideas are great, it's volume production that brings benefits to the masses. So far, no manufacturer has been willing to tool up to produce the unit. Kamen's good at solving technical problems. He might need some outside help with this one.

Next Meeting

Thursday, Dec. 6, 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

Our speaker this month will be Bob DiMeo. Bob is a member of EAA Chapter 106 and has recently finished building a RV-8 aircraft, a 21 foot two-seater. Here is a link to the RV-8 aircraft kit for those interested.

<http://www.vansaircraft.com/public/rv-8int.htm>

Bob is presently 32 hours into the test-flying phase.

Cabin Fever Expo Trip

It is that time again, Cabin Fever Expo 2008 calls. Last month we circulated a sign-up sheet during the meeting for the annual bus trip to the Cabin Fever Expo in York PA. Much remains the same as previous years, except the dates, prices and the motel. The show this year is January 19th and 20th, so make sure you mark your calendars! Remember the December meeting is the last chance sign up "in person" and early sign up makes it so much easier on me to sign the contract with the bus company. We will again travel with Brush Hill Tours and Mike Feldman will again be our driver.

We have a block of 25 rooms reserved at the Motel 6 at York. The rate is \$45.99 per room with an occupancy of up to 4 persons per night + applicable tax at the time. As previously, each individual is responsible to make their own room reservation. The block of rooms will be held by the hotel until Wednesday December 19, 2007. At this time the block will be released for general sale and any requests received after this date will be subject to availability at prevailing prices. The \$45.99 rate applies regardless of whether you travel with the group on the bus or drive down in your own vehicle. To make reservations call (717) 846-6260 and mention the New England Model Engineering Society Expo trip. You need a room for Friday night Jan 18th and Saturday night Jan. 19th. If you have any problems ask for Tom. The motel

is across Arsenal Road from our previous accommodation so we will still be able to use the same restaurant for breakfast.

Again as in previous years, we ask that you arrive at the Riverside "T" Station-Grove Street exit of route 128 Newton by 8:30 AM on Friday January 19th so we can leave at 9:00 AM. Mark will pick us up where he left us off last year, the area just inside the parking area. That way, we won't have to unload our show goods and then go park. We can just wait in our cars until Mark arrives with the coach. I have scheduled the two usual pickup stops at the Charlton rest area and again just south of Hartford CT. We will be making the usual stop at the rest area on the Garden State Parkway for a lunch at the various venues available there. The cost of the bus this year is \$135.00 based on 28 participants.

A last minute reminder will be sent out to those going on the bus.

Miscellaneous Ramblings

I went through my surgery very easily with no complications and was released from the Lahey Clinic around noon the day after the surgery. I still have a blood test next month to determine if I am out of the woods or will need additional treatments but the worse is over as they say. Thinking I would be laid up for some time after the surgery, I had stocked in a lot of reading material but I never got to read much of it, Victor sent me a book called *October Sky* by Homer H. Hickam, Jr. It is about the time in 1957 when Sputnik was launched. I must be about the same age as the author. At the old Haverhill Trade School that year, we built a sphere in the sheetmetal shop with antennas on it and a car battery that kept the model beeping as it hung in the gymnasium ceiling all during our annual open house that year.

Having weight and twisting motion restrictions by the surgeon, I decided to take it easy here in the shop. Inspired by Ray Harlen's magnificent flying demonstration at the May meeting I hauled out an old rubber-powered Comet model of a Curtis Jenny off the shelf that I had started years ago and have been finishing it. It has a 34 inch wingspan. It isn't an indoor model so I won't be demonstrating it at a meeting.

Dick B.



The Meeting

Todd Cahill

November meeting

The duties of the Vice President of our club are often kept a secret. Occasionally the vice president needs to fill in for an absent President. Frank Dorion took the reigns of the meeting for November. Frank reminded us of the upcoming Cabin Fever Bus trip in January. The Cabin Fever Model Engineering Expo is January 19th-20th in York, PA. The bus leaves Friday morning from the Riverside T-station and returns Sunday evening. It's important to get your reservations and deposits in now to hold your place and to see if the club has the minimum to get the bus and hotel rooms.

At the recent Model Engineering show at the Precision Museum in Vermont, Norm Jones got a special Friday-night tour of the storeroom collection at the museum. Rollie Evans is in the process of building a pony cart (?) for his 1906 Stanley steamer. Frustration with installing the brass threaded inserts available made him use steel alternatives. They installed much easier.

Our main speaker for the evening was member Harvey Noel, who presented the club with an opportunity in the form of some cast iron scraping gauges and a video explaining the basics of scraping. Harvey purchased the gauges on Ebay to scrape the ways of his small mill. Having successfully done that, he decided to offer them to the club for the price he paid of \$700. In use, the gauges act as long surface plates to check the flatness of machine ways. I believe there were two gauges, one for flat surfaces, and one for checking dovetails. They measured ~24" for the flat and ~16" for the dovetails. These are difficult to find at any price.

Also included in the offer is one scraper. It was decided to wait until the December meeting to make a decision on the club purchasing the items.

The video showed some of the basics of metal scraping. Topics included:

Basic tooling required which includes: a surface plate, cast iron flat gauges, a scraper, marking medium such as Dykem hi-spot blue and a dauber or roller to spread it on the gauge.

Sharpening a high-speed steel scraper. This entails grinding an arc on the end of the blade being careful to keep the blade cool and honing it by rocking it back and forth on a bench stone.

Breaking up the surface. When starting to scrape a new (or worn) surface, the surface should be scraped all over without regard to flatness or gauging. I believe this allows a better view of the high spots when the marking medium is transferred.

Scraping for bearing. The marking medium, a non-drying blue oil paint, is spread thinly on the flat gauge. Then, by rubbing the blued gauge on the ways, bluing is transferred to the high spots. These spots in turn, are scraped off. Upon completion of one cycle, the ways are cleaned off with a brush and then rubbed with the hand to detect any stray iron dust missed. The whole process is repeated (over and over and over) until high spots are revealed throughout the length of the ways. Some surfaces require fewer high spots per inch than others. Surfaces having a sliding contact might only need 10-20 spots per inch whereas a high-quality surface plate might need 30-35 bearing spots.

Flaking: In flaking, a checkerboard or crescent pattern is scraped into the entire surface. This final pattern both decorated the finished surface and also provides a number of oil reservoirs for lubrication.

The different scraping methods were displayed by scraping the top surface of a cast iron block. Although very informative, the video only scratches (or scrapes) the surface as to the necessary procedures for repairing a worn machine. Indeed, perhaps the club might consider purchasing a copy of Herb Connelly's tome on the subject Machine Tool Reconditioning to supplement the video.

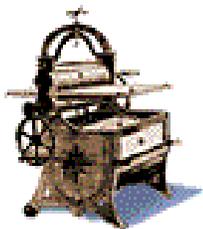
TDC



Treasurer's Report

Dick Koolish

Balance as of October 17, 2007	7361.45
November Gazette	-212.73
Whistle supplies	- 70.83
Sold 1 apron	+ 20.00
37 memberships	+925.00
Balance as of Nov. 25, 2007	8022.89



NEMES Gazette Editorial Schedule

Issue	closing date for contributions
January '08	December 21, 2007
February '08	January 25, 2008
March '08	February 22, 2008
April '08	March 21, 2008
May '08	April 18, 2008
June '08	May 23, 2008

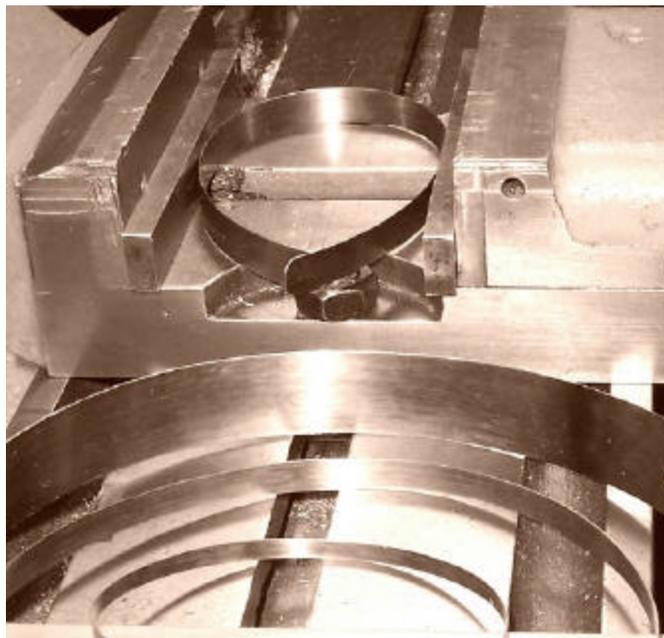


Shop Tips

Retainers for Vise Parallels

Based on a basic idea of Grady Sharpe's, I worked up some retainers for holding parallels in place against the jaws of a machine vise. The accompanying picture shows one retainer in use in the milling machine vise, and three more retainers, of differing sizes, laying next to the vise.

The retainer material is discarded steel mainsprings from old clocks, and was given to me by Jim Lea. The springs can be easily cut to length and width with tinsnips.



Different widths suit parallels of different heights. Without any annealing or bending, the existing springiness in the coil of these retainers does a good job of holding the parallels in place, and does it over a wide range of between-parallel separations.

Marty Feldman
Owl's Head, Maine



Building a Stirling Cycle Engine

Norm Jones

Some of you have may have seem my small Stirling cycle engine on display at our show last February. I got to thinking that this project might be a good subject to serialize in the Gazette. The design originates from a good friend of mine, Bob Simonik of Johnson City, New York. He scaled down a larger engine and sent me the some hand-drawn plans from which I built this engine. With Bob's OK and Les Russell's diligent efforts to redraw the plans, we now have something that I can provide to others who might enjoy building this engine.

My idea is to serialize this project over the next two issues. I will provide some insight as to how I machined various parts, which may help those of you who are new to the hobby. A bill of materials is included with dimensional information for the various parts. Raw stock needs to be a bit larger to provide a means of holding the part while machining. The hardware list gives suggested screw types but can be modified to use whatever you might have on hand. A sequence of machining will be given in a way to provide a sense of accomplishment as you complete various related components. I try to concentrate on an individual part rather than setting a time frame for the finished project. All dimensions are in inches. Good luck!

Bill of Materials

- 1ea Base 2.150 x 5.250 x .125 Aluminum
- 2 ea Upright 1.215 x .950 x .125 Aluminum *
- 1 ea Transfer Block 1.790 x 1.345 x .250 Aluminum
- 1 ea Flywheel 1.760 Dia x .365 Brass *
- 1 ea Crank Disk, Displacer .48 x .100 Brass
- 1 ea Crank Disk, Power .489 x .100 Brass
- 1 ea Power Cylinder .438 Dia x .680 Stainless Steel
- 1 ea Power Cylinder Mounting Ring .710 Dia x .062 Brass
- 1 ea Displacer Cylinder .465 Dia x 1.475 Stainless Steel

- 1 ea Displacer Cylinder Mounting Ring .710 Dia x .062 Brass
- 1 ea Displacer Cylinder Cap .465 Dia x .032 Copper
- 1 ea Cooling Fins 1.130 Dia x .422 Aluminum
- 1 ea Crankshaft .125 Dia x .860 Steel *
- 1 ea Displacer Piston .380 Dia x 1.122 Aluminum
- 1 ea Displacer Piston Cap .380 Dia x .150 Aluminum
- 1 ea Displacer Rod 3/64 Dia x 1.926 Drill Rod
- 1 ea Displacer Bushing .250 Dia x .375 Brass
- 1 ea Displacer Bearing .125 Dia x .437 Brass
- 1 ea Displacer Slide .495 x .125 x .210 Brass
- 1 ea Displacer Roller .093 Dia x .080 Brass
- 1 ea Connecting Rod 1.250 x .180 x .032 Brass
- 1 ea Connecting Rod Bushing .125 Dia x .054 Brass
- 1 ea Power Piston .282 Dia x .300 Graphite
- 1 ea Power Piston Insert .186 Dia x .250 Brass
- 1 ea Burner .500 Dia x .588 Brass
- 1 ea Burner Tube .125 OD x .062 ID Brass Tubing
- 1 ea Burner Cap .530 Dia x .245 Brass

*Size to match bearing

Hardware Required

- 2 ea Ball Bearing .312 OD x .125 ID x .125 thick
- 4 ea Fillister Head Screw 0-80 x 3/16 Upright Mounting
- 2 ea Pan Head Screw 2-56 x 3/16 Transfer Block Mounting
- 8 ea Socket Head Cap Screw 0-80 x 3/8 Power / Displacer Cylinder mounting
- 1 ea Set Screw 2-56 x 3/16 Transfer Port Plug
- 1 ea Flat Head Screw 0-80 x 1/8 Power Piston / Insert attachment
- 1 ea Set Screw 0-80 x 1/8 Displacer Bushing
- 1 ea Set Screw 0-80 x 1/8 Displacer Slide
- 1 ea Set Screw 0-80 x 1/8 Crank Disk, Displacer
- 1 ea Set Screw 0-80 x 1/8 Crank Disk, Power
- 6 ea Dowel Pin 1/16 x 1/4 Uprights and Transfer Block (alignment)
- 1 ea Dowel Pin 1/16 x 3/16 Crank Pin, Power
- 1 ea Dowel Pin 1/16 x 3/16 Crank Pin, Displacer
- 4 ea (Felt or Rubber) Mounting Feet
- A/R Double Sided Tape Mounting for Burner
- A/R Fiberglass Strands (Bundle .040 Dia) Wick for Burner

Fabrication Suggestions

The **Base** can be fabricated from $\frac{1}{8}$ " sheet metal. Make sure that the mounting surface for other parts is flat and smooth. Holes for dowel pins are to be drilled undersize. Final drilling will be done when the engine is assembled. The use of dowel pins enables one to be able to reassemble the engine without alignment issues. **DO NOT DRILL TRANSFER MOUNTING BLOCK MOUNTING HOLES AT THIS TIME.** 2.986 Dim is a reference. Actual location will be determined during engine assembly.

Fabricate **Uprights** as a pair. Bearings should be selected prior to drilling and reaming the mounting holes in the uprights. Mounting surface of uprights must be perpendicular to plan view to insure proper alignment with base. Move upright back and forth on 220-grit silicone carbide sandpaper, grit side up, on a surface plate. Use an angle plate to support the upright while performing this operation to insure a square edge.

Mounting surface of **Transfer Block** must be perpendicular with plan view. Use the same procedure as noted above for Uprights. Drill #50 hole (to be plugged later with 2-56 set screw) in the side of Transfer Block prior to machining counterbores.

Fabricate **Flywheel** by turning rim, facing one side, turning hub, and drilling and reaming crankshaft mounting hole in one setup to insure concentricity. Crankshaft to be attached with loctite (green-secure parts). Do not bond parts until final assembly.

Crank Disks should have both holes in each part drilled and reamed to size. Dowel pins to be pressed in place or attached with Loctite.

Power Cylinder bore should be drilled and bored undersize. Final size should be achieved by lapping to a mirror finish.

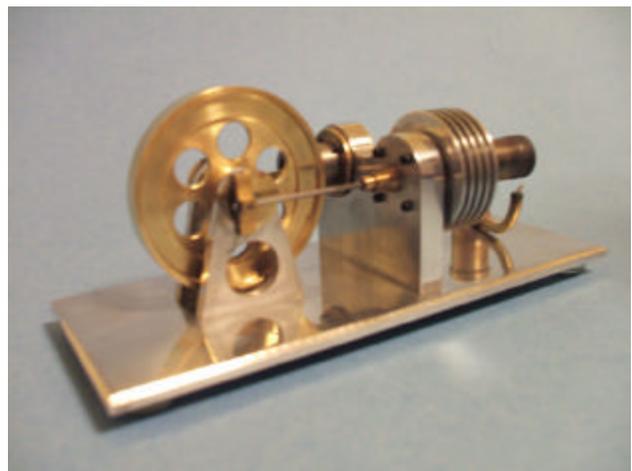
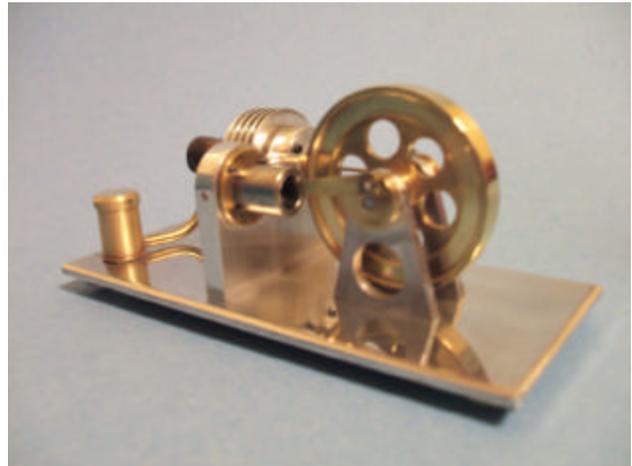
Displacer Cylinder should be drilled and bored to .400" diameter. Lapping is not required. Use an expandable mandrel or make a tight fitting wooden insert to support cylinder while turning outside profile. Turn cylinder on centers.

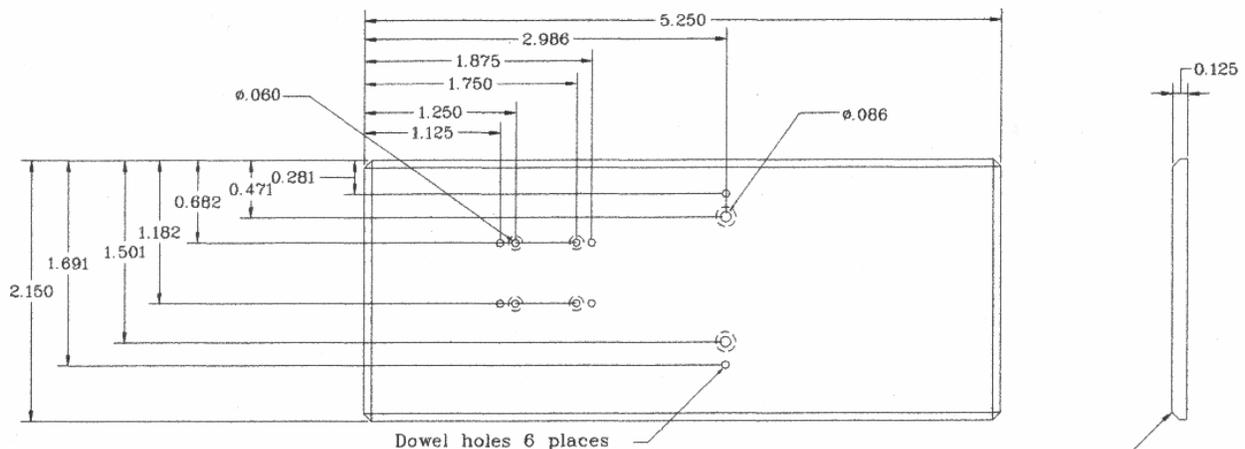
Copper End Cap must be silver-soldered (silver-brazed) in place. Do not use soft solder. Machining a small shoulder on the cap will help maintain alignment while soldering in place.

Cooling Fins must have good sliding fit with displacer cylinder for proper heat transfer.

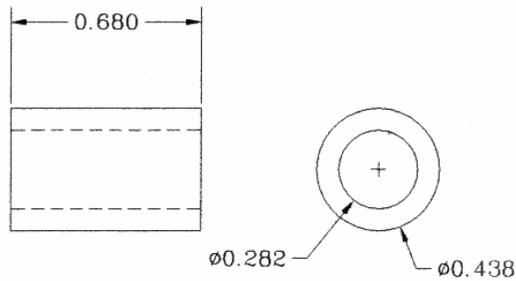
Silver solder **Mounting Rings** on Power and Displacer Cylinders. The Power Cylinder uses the ring with the tapped holes. The Displacer Cylinder uses the ring with the thru holes. Position rings .120" from appropriate end. Re-machine mounting rings to achieve .124" dim. Re-machine the other side of the Displacer Mounting Ring as well to achieve a square mounting surface for cooling fins.

The next Gazette issue will cover machining of the remaining parts as well as final assembly.



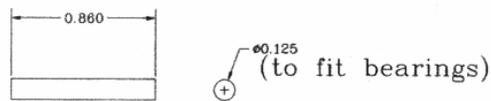
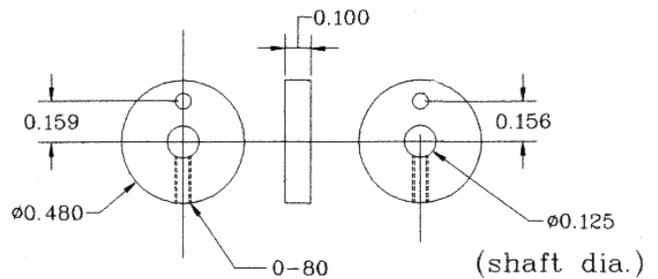


Counterbore or countersink back side as appropriate. Chamfers as desired
 Drill dowel holes undersize and transfer at assembly
Base



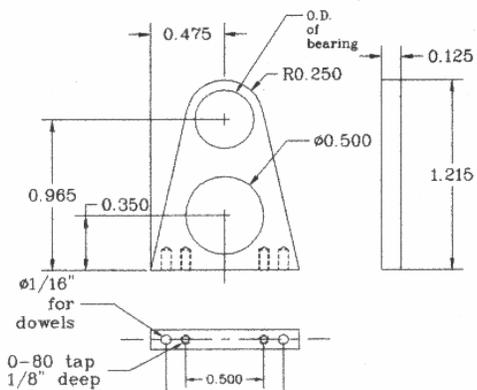
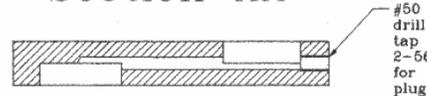
Power Cylinder

**Crank Disks
 DISPLACER POWER**

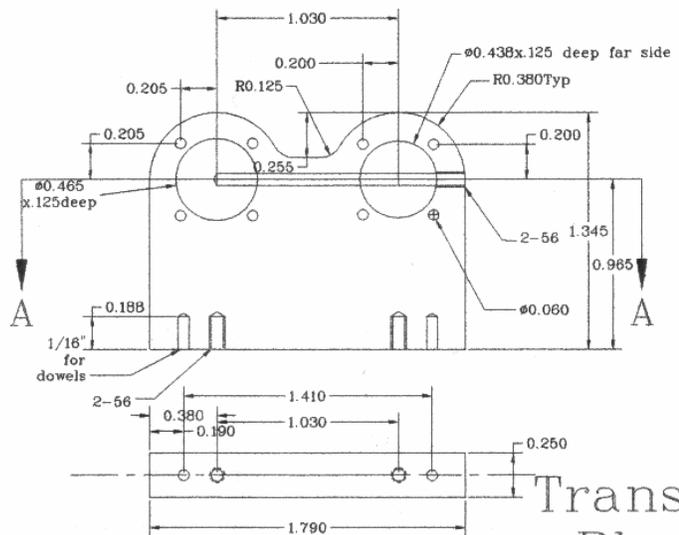


Crank shaft

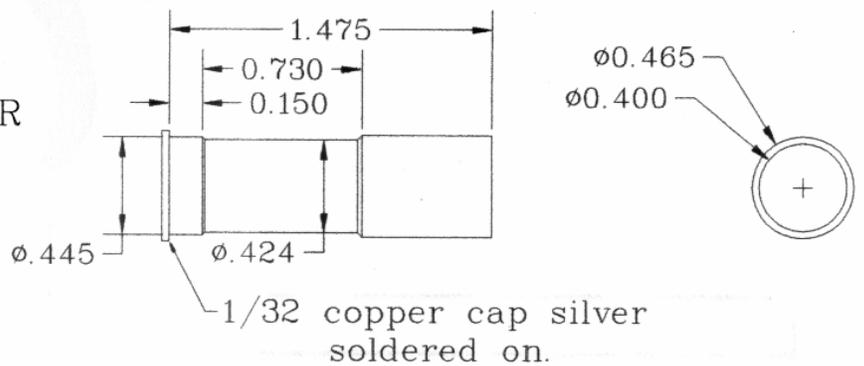
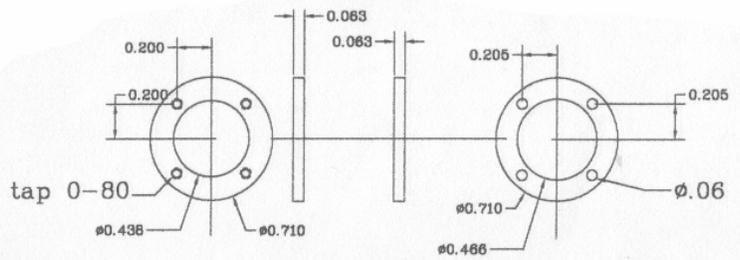
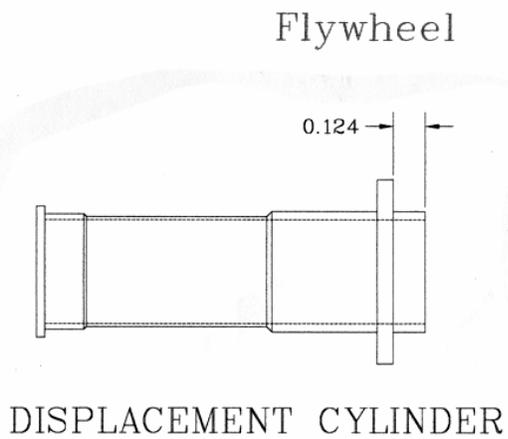
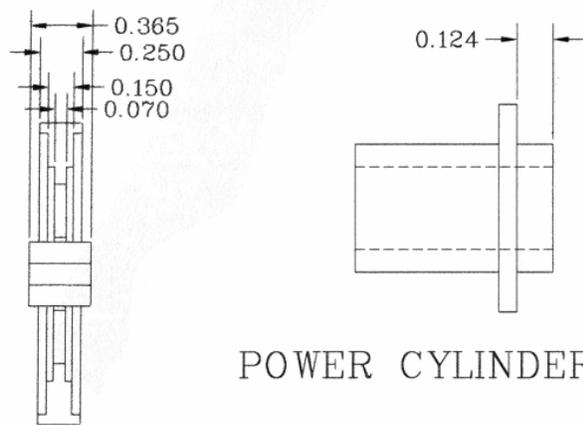
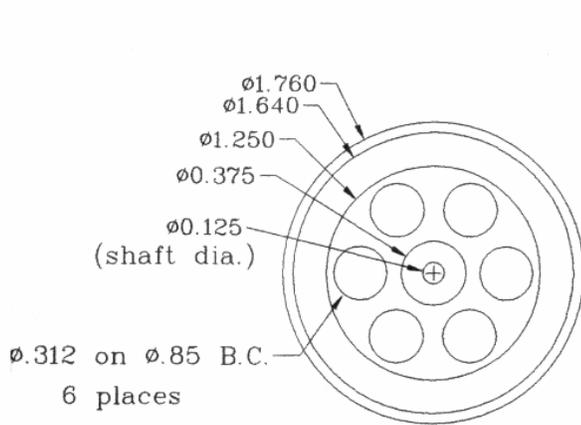
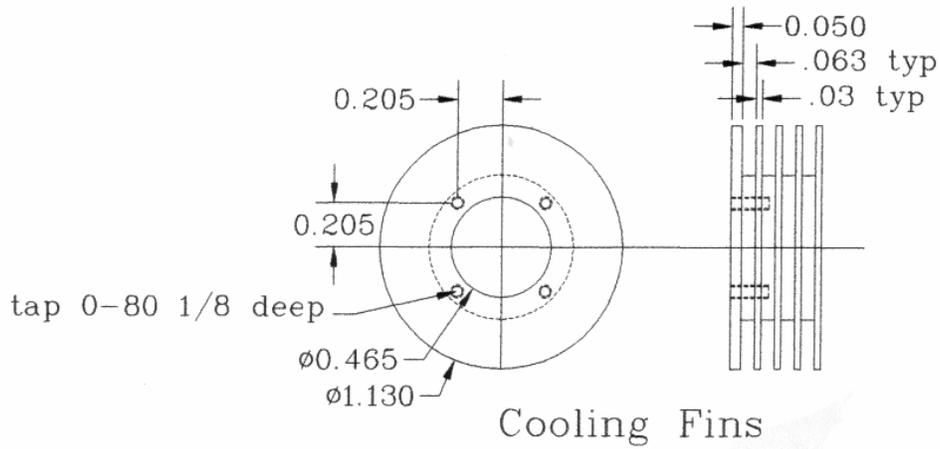
Section AA



Upright



Transfer Block





For Sale

Help Needed

I recently spoke with a clockmaker friend about a lathe he owns. The job of repairing/restoring it was more involved than he thought and he could use some help. I offered to pass this along. - Editor

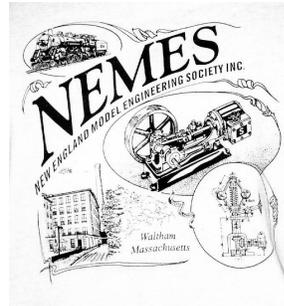
I'm hoping someone might be interested in refurbishing my lathe. I have an ATLAS metal lathe that is approximately 24" long overall, including the head and tailstock. It has a cross slide with tool rest and screw-cutting capability. The motor likely came from an old washing machine or the like and it was hooked up in a "Mickey Mouse" fashion. When I got it, the entire lathe was coated in 40 years of grease and grime. I have cleaned it, but stopped there, as I didn't have the time or the proper knowledge to do any more. I would like to refurbish/restore it if I could. That being said, would anyone like to take on the job?

Joe Seremeth
W. Brookfield, MA
djws@aim.com

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

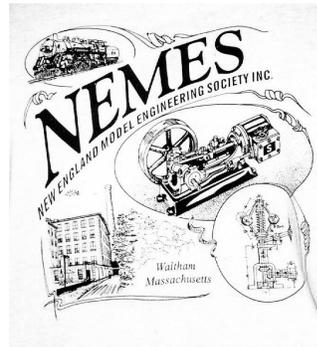


NEMES clothing

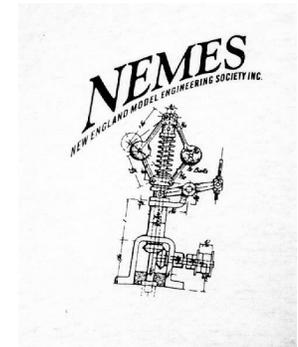
NEMES Tee Shirts

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

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



Upcoming Events

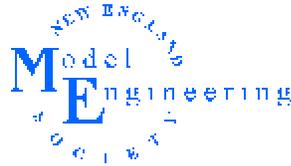
Bill Brackett

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.

Bill

Dec 6th Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry
Waltham, MA
781-893-5410
December 4, at 8:00 PM **and** 12:00 AM
"Made In America" TV Series to Profile Starrett

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



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)