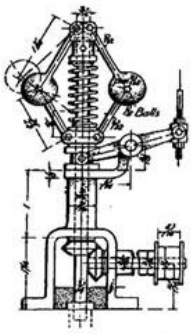
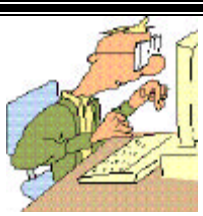


The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

Vol. 08 No. 088 August 2003



Editor's Desk

Mike Boucher

Hi folks,

"Reality TV": to most people, it means shows such as "The Bachelor", or "The Osbournes", where camera follow "average people" for a period of time and show what happens, or "Survivor" and "American Idol", which are basically season long game shows. Most people I talk to hate them, but they don't seem to be going away. Personally, I think most of these shows are another sign that the apocalypse is upon us.

On the other side of the "Reality" coin are shows such as "Junkyard Wars". The combination of watching people build stuff, competition, and ingenuity makes this a good show, as far as I'm concerned. In case you didn't know, at least one NEMES member competed quite successfully on this show.

Recently, I started watching another "Reality TV" show which other members might be interested in, so I thought I would pass it along. It's called "American Chopper", and it is on the Discovery Channel, with new shows on Monday nights at 10:00PM.

Continued on Page 2

Next Meeting

Thursday, Aug 7, 2003

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.

Please make checks payable to NEMES and send to our treasurer.

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

Addresses are in the left column.

Contents

There's no competition. The show focuses on a custom motorcycle building company, Orange County Choppers, near Newburg, NY. The two main "characters" are a father-son combo, Paul and Paul Jr., the father being the proprietor. You get to watch the design and construction of a custom chopper over a few weeks.

It's light on technical details, but that's to be expected. Sometimes, they touch on subjects that NEMES has discussed. For example, last week's episode had a 5-minute segment showing them powder-coating some of the parts. They didn't go into technical details, but since I've read the articles in the Gazette, I knew what was going on. You should have seen the size of the oven!

You don't have to be a fan of motorcycles to appreciate the workmanship involved in building one of these bikes. The last motorcycles I've seen them complete were "theme bikes", one with a fire truck theme called the "firebike" and another built to look like a US Army Comanche helicopter. They do fantastic work.

Being a reality show, you do get stuck with seeing how the personalities involved deal with each other (read: yell at each other). You see things go wrong, like an engine blowing up a few hours before the big show where they're supposed to ride it in, and there is some pretty ridiculous stuff sometimes, such as showing the owner playing in the surf with his dog.

But, all things considered, you get to watch craftsmen do what they do best, build motorcycles, and build them well.

It might be worth checking out if you get Discovery Channel. The show is on several times a week. Check your TV guide to see when it is showing.

By the way - the "firebike" was dedicated to the 343 New York City firefighters killed on Sept. 11, 2001.

C'y*a*
Mike

President's Corner

Norm Jones

The Meeting

Our speaker for the August meeting will be Mark Schirmer, who is Engineering Manager, Inertial Products, Analog Devices, Inc. The subject will be "An Introduction to Micromachining". Mark will discuss Analog Devices' micromachining process which has been producing accelerometers for approximately 8 years. If you drive an automobile equipped with an airbag, odds are that a micromachined accelerometer is used to sense when the airbag needs to be deployed - and there is a very good chance that accelerometer was produced by Analog Devices in Cambridge. These components are a member of a wider family of MEMS (Micro Electro-Mechanical Systems) which use silicon as both an electrical and mechanical material.

Unlike conventional machining, MEMS are produced using photolithographic and etching techniques which result in critical dimensions on the order of 1 micron (about 40 millionths of an inch) with tolerances less than 0.01 microns. Furthermore, devices are produced thousands at a time with near perfect device-device matching. Mark will walk though the production process and discuss the operating principles of micromachined accelerometers and angular rate sensors (also known as gyros). Several devices will be available for inspection along with some interesting (and fun!) demonstrations of MEMS technology. Bring your magnifying glass and brush up on your Greek engineering prefixes (micro, nano, pico, ...)!

Poster Session Follow-up

Once again the semiannual poster session format has proven to be a popular event. There was a very respectable turnout, even though "the night before the fourth" presents many options for that evening. As always, there were quite a number of interesting displays which I am sure will be covered in more detail elsewhere in this issue.

It was good to see Ron Ginger at the meeting. Congratulations are due to Ron as he has become a grandfather for the second time. This

was also the shakedown trip for Ron's newly acquired fifth-wheel rig.

Thanks to Gail Martha for providing refreshments during the evening.

Another Casting Set!

As many of are aware, from time to time I come across a casting set that I simply must have to add to my already significant inventory. My first exposure to the Rowland Manufacturing Co. "Flame Engine" was last year at the Coolspring Antique Engine Show. At that time, it was more of a passing glance! This year however, I took a closer look and learned that this design is the work of a young fellow from Ohio who has put in a tremendous amount of effort in coming up with a most interesting engine. The basic engine can be built as a steam engine or a flame engine with a "hit and miss" version soon to come.

One needs to make a decision at the time of purchase as to which configuration you want to build, as the plans are unique to that end. I went with the "Flame Engine" option as I don't have one of those yet.

I have looked over the plans and they represent a measure of detail that I have never seen before. In my opinion, scoping out the task at hand is crucial before ever turning on the lathe or mill. There are detailed instructions on how to proceed with each and every part that will certainly improve your chances of successful completion of this project. The completed engines that were on display ran beautifully. I can't promise when I will actually build this engine, however it looks like an interesting project.

Check out Rowland Manufacturing's website: http://rowland.20megsfree.com

See you on August 7th!

Norm

The Meeting

Max ben-Aaron

July meeting.

Because the July meeting was to take place on the day before the July 4th holiday, Venerable President Norm Jones wisely decreed that it should be a "Poster Session". Under the circumstances, a surprising (to me) number of members arrived in the Jackson Room at the Museum to do just that.

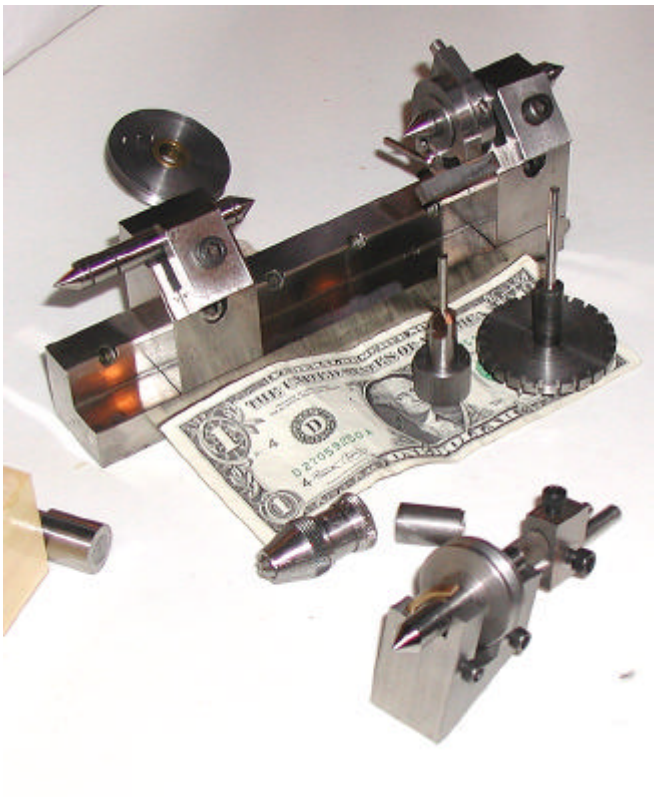
NEMES members and projects at poster session

Earle Rich photo

Earle Rich demonstrated that a regular lamp dimmer can control an electric motor. This is against the conventional wisdom that says one ought not do this because the dimmer is not supposed to be able to handle inductive loads. He showed how a dimmer and a bridge rectifier can easily control quite a powerful DC motor that he salvaged from a treadmill. I won't swear to it, but I recall that he said that the motor was the result of dumpster-diving.

Larry Twaits brought a tiny set of bench centers, a tool for grinding the taper on the actual centers it

uses, and a taper gauge. He also showed some tiny tapered spindles that he made with the apparatus. Everything was up to the usual high standard that we have come to expect from him.



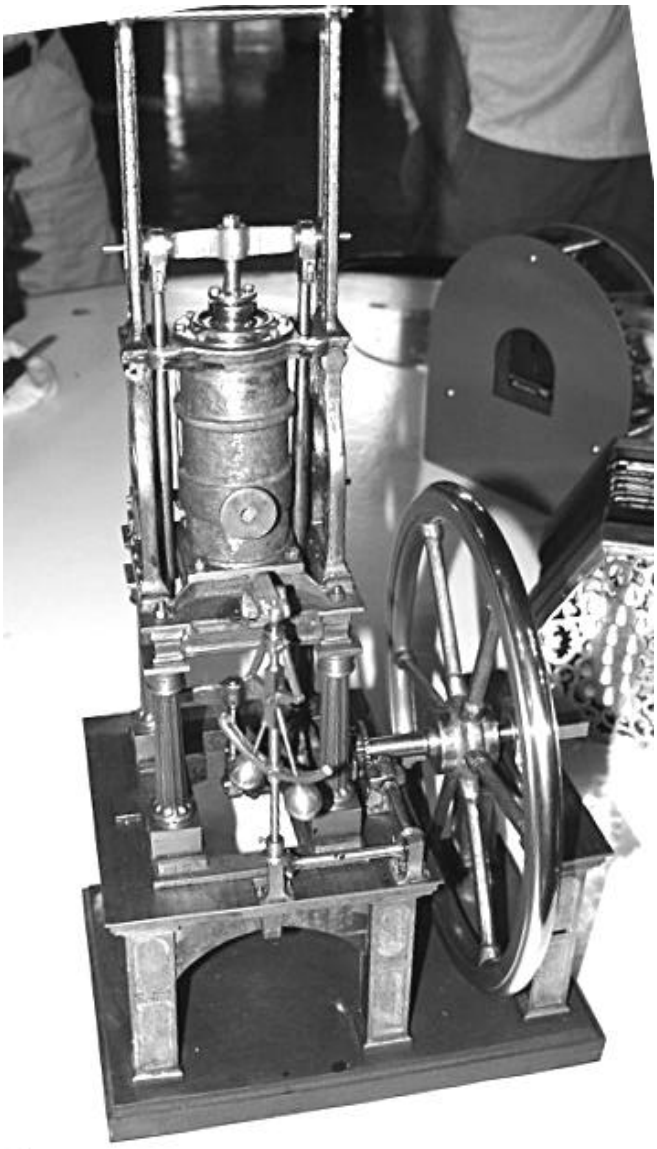
Larry Twaits Bench Center and Tooling Errol Groff photo

Bill Schoppe showed a couple of old engineering books, one published in 1920 and a model-engineer's book from 1897. Bob Cline brought a great blueprint of the engine room of the Titanic and explained how reversing was done.

Dick Boucher, who is always educating us, brought some double angle (Erickson) collets and some plastic collets. In case you're wondering, the plastic collet was made for a violin bow maker. During his talk at the last meeting, Dick mentioned an optical center-finder that fits into a machine's spindle. Gene Martha brought in an optical center of that type.

Bill Brackett is building a 'clock' that uses rolling marbles. During our February show, a young gentleman brought a marble pump that he made from Lego parts. Bill built a similar pump for his clock and then he made a golf-ball pump, which he showed. He also brought the patterns, drag and cope for parts for a shifter for overhead belt drives. Bill demonstrated how the pattern plate should be used for casting parts. Bill also showed some of the parts he had cast.

Some time ago Jim Paquette announced that he had some model steam engine castings for sale. Todd Cahill bought one of them - a Matthew Aitken Scottish steeple engine and actually finished (I chose that word advisedly) the engine. It was very impressive and would not have looked out of place among the model steam engines in the Science Museum in London.



Todd Cahill's Steeple Engine Earle Rich photo

Dr. Clive Dalby brought a "whatsit"? Several members, notably Bradley Ross, knew exactly what it was and how it worked. It was a sharpener for sickle cutters.

Max ben-Aaron brought in a miniature milling machine. He had brought it to previous meetings, hoping that somebody could identify it. This time, Fred Widmer was there. Fred instantly identified it as having come from the Waltham Watch Company, and announced that he had two just like it.

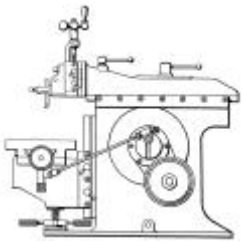
Errol Groff brought in some sprocket clocks that he and his students make on a CNC machine, as recruiting aids for his classes. Henry Szostek displayed parts of a water pump from a 1905 American Mercedes-Benz. He is restoring the pump and made a new impeller for it on his CNC mill.

Rollie Evans showed an incomplete Derr boiler that he is in the process of having built for his Stanley Steamer. Walter Winship brought in a whistle body with an internal valve cast in place. Exactly how this was done is not evident.

I hope that I have mentioned everybody who showed anything, but I have a nagging feeling that I have missed somebody (Ed Rogers?).

Last, but not least, the incomparable Gail Martha provided refreshments (including absolutely sinfully-delicious cookies). At the end of the evening, Gail presented treasurer Rob McDougall with the takings for our funds.

Max



Shaper Column

Kay Fisher

Alba 4S Under Power

Our shaper story this month comes from John Olsen in Auckland, New Zealand. I think the title says it all!

I feel the earth move under my feet

"Well, it's really a bit premature to do this, because the machine is really not properly cleaned yet, but I got to the stage this afternoon where I put the vice back on, stuck a tool in the post, and tried out the "new" Alba 4S. Very successful! It runs quite quietly, with no embarrassing knocks, and peels off lovely big cuts. It is only running off single phase, but I'm stepping up the voltage using an isolating transformer to give it the voltage it needs. The motor doesn't self-start, so to run it, I have to turn it on, put a foot against the large pulley and give it a quick push in the right direction. Then, it runs up to speed. The machine has a clutch so you don't have to start it under load.

I'm monitoring the current with a clip-on ammeter and it takes 4 Amps, only taking the odd flicker up to 5 A or so. Since the motor is rated for 6.9 A, that seems fine. After running for half an hour or so, it was getting to the point of being just too warm to leave your hand on. This is good, because the 460V I get with the transformer is slightly more than the 415-440V specified. Longer term I would like to drop it down a little. I had the ideal transformer before I moved but sadly it went for scrap.

As my choice of title implies, you can feel the concrete floor moving slightly as it runs. I wonder how thick the concrete is? Curiously, the big Jones and Shipman tool holders I use with the Alba 1A are too wide to fit into this toolpost, so at the moment I only have a couple of strange tools that I can use, made from rather big chunks of tool steel. It came with a holder that will take a $^{5}/_{16}$" square bit, and can set it at 0^{o}, 45^{o}, and 90^{o} around the circle. It looks potentially useful but is still a bit too rusty to try. It's probably only really useful for lighter work.

…

Time has passed since the above was written. I have made a pattern for a casting for the support foot. There is supposed to be a flanged casting under the table with a setscrew to allow adjusting the foot. This has been lost somewhere along the way. It just came with a piece of steel tube with a closed end and a collar to take the thrust. This is not supported very well, since it tends to drag sideways. I made the pattern with the idea that I will get two castings made. One will bolt under the table as described and the other will go on the end of the support to spread the load over a larger area, rather like my AMMCO does. The patterns just need painting and finishing before sending to the foundry. I have also made a pattern for a copy of the AMMCO vice, and a pair for a copy of the AMMCO dividing attachment.

I have also had a little bit of luck with suitable tool holders. A local tool dealer has just moved and decided to sell off some of their old inventory.

Among this I found two brand new Jones and Shipman shaper/planer tool holders. One is the type mentioned above, but larger. This is a more suitable size for the 4S, so I have cleaned up the other and put it with my 1A. (Yep, there are three shapers here...) The other tool holder is like the ones used with lathes but without any top rake built in. That was a good sale. I also scored a Posilock chuck for about $1.00 and a Clarkson autolock for $10.00. Plus, I got various 4 MT and 2MT shanks, brazed carbide tools and so on.

I have also decided that the three-phase motor and pump left by a previous owner of this house is now mine. It was supposed to be collected by a friend of the previous owner, but he has not showed up and it has been six months. Anyway, it is a three horsepower three-phase motor, so it should make an excellent rotary phase converter. That will mean that I will no longer have to kick the pulley to start the machine.

The Alba 4S itself is very nice to use. It is actually easier to run than the smaller Alba 1A. This is partly because the stroke adjustment is more accessible, and can be adjusted with the machine in any position. Also it has a very low speed gear and an easy to operate clutch. This permits using power to creep the machine to any position, either while setting stroke and ram position or for checking clearances. This is better than pulling the belt around by hand.

If anyone wants a machine of similar size, I think the local dealer still has a Russiana machine. It has twenty inches of stroke, and twice the weight of the Alba 4S. It is a very solid looking machine. Of course the shipping expenses would be a killer if you don't happen to be in New Zealand."

Thanks John for that great shaper story. Keep sending letters and email with questions and interesting shaper stories.

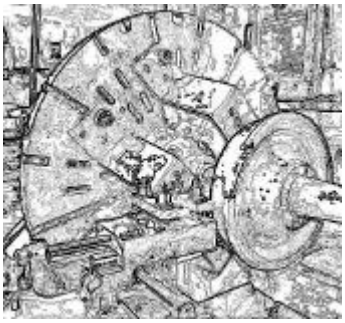
My mailing address is:

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

My e-mail address is:

KayFisher@att.net

Kay



Museum Shop Update

Fred Widmer and Max ben-Aaron

Volunteering at CRMI

There is still room for Thursday volunteers at the Charles River Museum of Industry. If you can't volunteer on Thursdays because you work (or some other such frivolous reason), Fred Widmer is in the museum shop on some Saturdays, too. To whet your appetite, here are some of the projects that are crying out for your attention:

The Ford Model T chassis is in fine shape, but the engine has not been run for 15 years or more. It needs to be put in running condition and to have a bench seat mounted on the gas tank. If it had a small auxiliary gas tank that provided gravity-fed gas to the engine, it could be driven around the mill-building complex. It's private property, so no registration is needed.

The Ford Model A cutaway demonstration engine needs a bracket for it to be hand-cranked, so that visitors can turn it over and see how the innards work - moving pistons, valves, camshaft, oil-pump. Needs physical therapy for stiff joints.

A beautiful, but arthritic, marine steam engine needs a physical exam and exercise program so it can again be driven by the electric motor to show its moves when it was a young working power plant.

The 1908 MM Special motorcycle, with a leather belt drive was made in Brockton. Some maintenance is required before it can be fired up. The goal is to have a volunteer ride the motorcycle in public parades. A period costume for the rider is desirable, but not mandatory.

A Brown and Sharpe screw machine needs a dominating supervisor to tell it what to do and how to do it.

There is a 1907 Buckboard Orient Runabout, with the optional larger two-cylinder engine and friction drive. Like the MM Special, this antique needs to be driven in parades by you, to the deafening

applause of cheering crowds. The usual maintenance and TLC is required.

These are some of the more exciting projects. As always, there are a lot more available. Come along. You will surely find an interesting project that suits your interest and provides a venue for you to show off your unique talents.

We can guarantee, from personal experience, that volunteering at CRMI is a worthwhile and rewarding experience. It is low key, low pressure and provides great opportunities for socializing.

Fred & Max

In the News

Compiled by
Mike Boucher

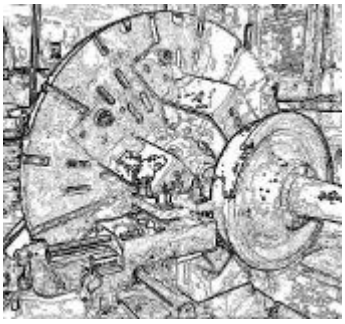
In the July 24, 2003 issue of the "Georgetown Record" newspaper, there is an article called "Man and Machines", by Sally Applegate. This article is all about Dick Boucher's model engineering hobby.

The article is about a page and a half long, with 5 photos by Tony Carolina. The article talks about his educational background and work experience, and how it related to the hobby. He discusses building his live steam locomotives, and includes a photo of him operating 7.25" gauge steam engine, built by Dave Smith, at the Waushakum Live Steamers track. It also mentions how he built his own backhoe. Fellow NEMES members Ron Ginger and Steve Peters are given credit for helping him set up his CNC Bridgeport milling machine. Dick also talks about buying his 1940s vintage Monarch 10EE at an auction, as well as other machines.

Dick says autographed copies will be available at the August meeting.

A copy of the article is on the papers web site at this address (you have to type this whole long thing into one line).

http://www.townonline.com/georgetown/news/local_regional/geo_newgrboucherdmpc07232003.htm



Shop Hints

Compiled by
Mike Boucher

Holding Fragile Shafts

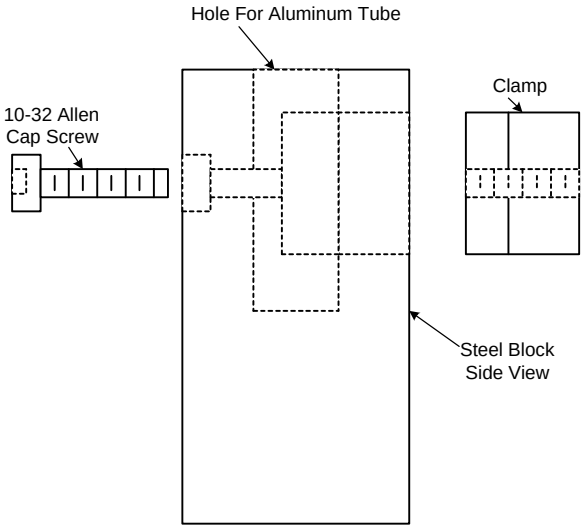
By Bob Neidorff

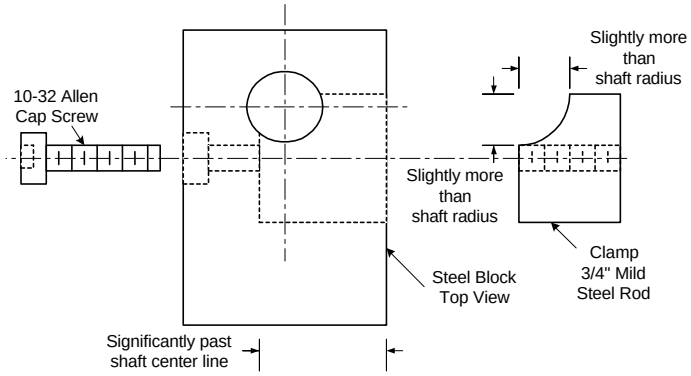
I needed to securely position a $^{3}/_{8}$" aluminum tube in a 1" thick steel block and wasn't sure how to do it. I didn't want to use a set screw, because it would damage and possibly crush the aluminum tube. I didn't want to slit the steel block and pinch it on the shaft because it would weaken the block too much. I considered putting a collet in the steel block, but that would require drilling a tapered hole…and buying a collet!

I settled on another common shaft-holding device, a screw pulling a curved block into the part.

The device starts with a block of steel drilled to the shaft size. Then, a hole is drilled at right angles to the shaft hole, just missing the shaft hole. This second hole is then bored out to hold a shaft clamp with a quarter circular cutout that presses the shaft against the hole. The other side of the hole is bored out for the head of an Allen cap screw.

Here's a sketch of the device:





In my case, the shaft is $^3/_8$" diameter. The first hole accepted a 10-32 cap screw, so was drilled #10 or 0.193" and counterbored $^5/_{16}$" on one side. The other side was counterbored ¾" slightly more than half of the block thickness, to accept the clamp.

I thought that the hardest part of the job would be making the clamp with a proper quarter circular cutout. I was pleasantly surprised at how easy this was. Instead, the hardest part of the job was drilling the 0.193" hole near the $^3/_8$" hole but not touching it. If the holes overlapped at all, then the aluminum shaft would interfere with the screw. If the holes were too far apart, then the clamp would not overlap the shaft significantly and the clamp would be weak.

I'm very grateful to Dick Boucher for his lecture on locating holes at the May 2003 NEMES meeting. Without his teaching, I would never have put the hole in the right place. Once I located the hole, I used my lathe and a four-jaw chuck to hold the part on center and drill the 0.193" hole and counterbore it to ¾". The lathe allowed me to put both holes exactly on the same center. Then, I flipped the work over in the four-jaw chuck, aligned on the 0.193" hole, and counterbored $^5/_{16}$" for the cap screw.

To make the clamp, I drilled a piece of ¾" steel #21 to prepare it for tapping. Then, I moved the shaft to a spin/index collet fixture on my mill. This positioned the shaft horizontally next to a $^3/_8$" vertical end mill. I milled out a tiny corner of the end of the shaft and tested it on in the bore…not enough. I put the piece back in the mill, lined it up by eye, and cut deeper, removed the part, checked the fit, put it back in the mill, cut some more, etc. until it just barely overlapped the shaft hole. This went quite fast, despite the constant testing and repositioning.

In doing this, I learned two tricks. The first is to mill just a tad more than one-half of the cutter diameter into the part, both in depth and in radius. The second is to counterbore the block deeper than necessary so that there is room for the clamp to go past the tube. The next time that I make one of these devices, I believe that I'll be able to make the clamp in one operation, without testing.

I'm very pleased with the result. It grabs the shaft firmly but without any risk of damage. Set screws are easy, but for a strong grab, this clamp is great!

Bob

1" Belt Grinder

By Fred Widmer

You need a 1" belt-grinder in your shop.

A 1" belt-grinder is an indispensable shop machine for smooth off-hand grinding of lathe and drill bits, fast deburring of ragged edges, and non-critical squaring of sawn tubing. It works on thin-wall square tubing, too (try that in the lathe) and corrects the edges of large and small sheet-metal fabrications when you don't have precision shears to work with. It is useful for grinding rust off the surface of those older pieces of round and flat stock that would be just right if only they were clean, and removing the metal thrown up when drill shanks or flat washers are galled (Use a light touch and good aim).

An 'off-hand' tool, its precision is as good as your eye.

When profiling or smoothing castings, a slide-guitar type finger-cover (made of cardboard and tape; worn over the first or middle finger) becomes a manipulable 'back plate' for when the job is more extensive than your callouses can handle.

Fred

Orange Show Photos

On June 28-29, the Central Massachusetts Steam, Gas & Machinery Association sponsored its annual show at the Orange Airport. The Venerable Norm Jones announced he would be displaying and invited NEMES members to come and join him. He was pleased when he came back from registering his display to find that Rollie Gaucher had joined him. Here's a photo of their display.

Bill Brackett Photo

Mike Boucher photo

The lovely Karen Boucher was hoping the Orange historical society would fire up their Grout steam car, so she could take it for a spin!

Bill Brackett Photo

Rollie Gaucher preparing his Bentley BR-2 for demonstration

Treasurer's Report

Rob McDougall

As of 6/30/03

Balance as of: 5/31/03	**$7,135.19**
Donation from Jim Paquette	140.00
Dues Received	50.00
Interest Income	.83
Less	
Gazette expense	-186.28
Balance as of: 6/30/03	**$7,139.74**

Rob

For Sale

Heavy Duty Paper Cutter

I've had great plans for this industrial-duty paper cutter but never got to them. This is serious cast iron, not a photo trimmer. It is meant to trim hundreds of sheets at a time. Addressograph-Multigraph is a maker of printing presses, and must have made this to accompany them.

Addressograph-Multigraph Model 130 Paper Cutter

- Maximum Paper Stack: 1"
- Maximum Paper Width: 11"
- Maximum Paper Depth After Cut: 17"
- Power: 115VAC
- Machine Weight: approx. 150 lbs

The paper cutter is powered from 115VAC and uses a GE motor to drive a hydraulic pump for power to move the cutting blade. The blade remains horizontal but moves up and down at an angle, giving a slicing action. The machine is complete and comes with two extra blades.

This machine is not in perfect shape. I bought it from a school print shop and never used it or tried to get it working. It will take a bit of work to make it pretty and useful. Or it could be parts for a machine of your own design for a completely different function. A bender? A sheet metal shear? A veneer shear?

Contact Bob Neidorff
(603) 472-2237
mailto:Neidorff@ti.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. $5.00 shipping included.

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

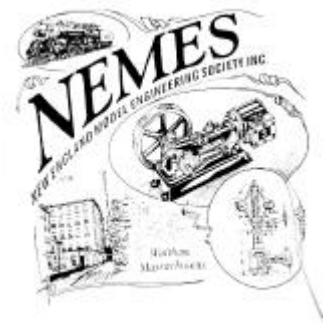
NEMES clothing

NEMES Tee Shirts

NEMES tee shirts are available in sizes from S to XXXL. These are gray short sleeve shirt, Hanes 50-50. You won't shrink this shirt! Artwork by Richard Sabol, printed on front and back.

Xtra-Large tee shirts are now ***OUT OF STOCK!*** If you're interested, let us know so we can judge if/when to reorder. All other sizes still available.

Artwork:



Rear

Front

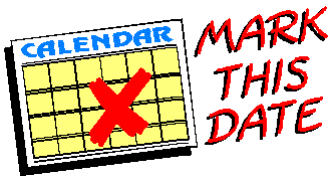
Prices:

S - L	$12.00
XXL	$14.00
XXXL	$15.00

Add $5 shipping and handling for the first shirt, $1 for each additional shirt shipped to the same address

Profits go to the club treasury.

Mike Boucher
10 May's Field Rd
Lunenburg, MA 01462-1263
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.

Aug 2-3 - Scribner's Mill Show

Harrison, ME. John Hatch (207) 563-6455

Aug 7 - NEMES Monthly club meeting

7PM - Charles River Museum of Industry, Waltham, MA (781) 893-5410

Aug 8-10 - Iron Fever Expo

York Fairgrounds, York, PA. (Same site as the Cabin Fever show) (800) 789-5088
http://www.cabinfeverexpo.com/

Aug 9-10 - Straw Hollow Show

Pine Ridge Farm, Boyleston MA.

August 9–10 - 29th Annual Transportation & Aerobatic Spectacular

Owls Head Transportation Museum, Owls Head, ME.

Aug 13-16 - Rough and Tumble Thresherman's Reunion

Rt 30, Kinzers, PA. (717) 442-4249

Aug 16-17 - Mystic Seaport Antique Marine Expo

A show for Marine engines only! Mystic CT, Geo King (860) 572-0711.

Aug 17 - MIT Flea Market

9AM-2PM Vassar St. Cambridge MA.
http://web.mit.edu/w1mx/www/swapfest.html

August 22, 23 & 24 - 33rd Annual Meet

Waushakum Live Steamers, Holliston, MA
Mike Boucher (978) 345-7741

August 23 - 26th Anniversary New England Auto Auction

Owls Head Transportation Museum, Owls Head, ME.

August 31 - Antique Motorcycle Festival
Owls Head Transportation Museum, Owls Head, ME.

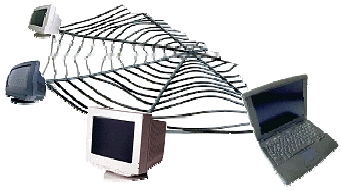
Sept 4 - NEMES Monthly club meeting
7PM - Charles River Museum of Industry, Waltham, MA (781) 893-5410

Sept 6-7 - Granite State Steam and Gas show
Dublin, NH, Phil Barker (603) 495-3640

Sept 20-23 - Cranberry Flywheelers show
Edaville RR, So. Carver, MA. Rochester Rd off Rt 58. Dave Moore (508) 697-5445

Sept 21 - MIT Flea Market
9AM-2PM Vassar St. Cambridge MA.
http://web.mit.edu/w1mx/www/swapfest.html

Bill



Web Sites of Interest

Workholding Techniques
Hardinge has a 112 page document called "Basic Workholding Techniques" available in PDF form on their website. I haven't been able to read it yet, but I downloaded it and there's a TON of info on collets in there. Chapter 12 looks interesting, "chucks vs collets", and has sections on "reasons for selecting a jaw chuck" and "reasons for selecting a collet".

It's downloadable on Hardinge's web site

http://www.hardingeworkholding.com/w4faq.html

That same page also has a large FAQ section about collets, such as "What is the correct procedure for boring out an emergency collet?"

Rowland Manufacturing
This is the company that produces the flame engine Norm described in his column. It's an interesting looking model, and the video of it running, with the flame shooting out the top, is pretty cool.

http://rowland.20megsfree.com

"The sunmachine"
This page highlights a solar powered water pump, the pump being driven by a free-piston Stirling engine. It also has interesting developments on Stirling engines.

http://www.sunmachine.de/english/main.html

(There's also a page on this website in German, if you're so inclined.)

"Ernie's Massive Metal Links List"
This is a links page, with an absolutely ungodly amount of links on an incredible number of subjects, such as 25 links on Knife Grinding and 9 links on 3 phase converters. I lost count of welding links, but there were four just on Thermite.

http://www.stagesmith.com/Metal-links.html

Thanks to Fred Jaggi for the submission.

Bamboo Bike
Sometimes, we get a bit locked into our metallurgical mindset. It's nice when someone thinks outside the box, so to speak:

http://www.americanbamboo.org/GeneralInfoPages/BambooBicycle.html