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August 2002

The NEMES Gazette

The Newsletter of the New England Model Engineering Society

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Contents

Next Meeting

Next meeting will be Thursday, August 1, 2002

The Charles River Museum of Industry
154 Moody Street
Waltham, Massachusetts

Annual dues of $25 covers from Jan to Jan. Please make checks payable to NEMES and send to our treasurer. (Address in masthead.)

Missing a Gazette? Send mail or email to our publisher. (Address in masthead.)

The Editor's Desk

Mike Boucher

Ever have one of those days where it seems like you just shouldn't have gotten out of bed? Well, when it comes to my live steam locomotive, it's been that kind of year…

The first steaming of the engine this year brought upon a plethora of problems.

First was a problem I've known about and haven't been able to solve. My riding car rolls like a brick. In case you're unfamiliar with the term, a "riding car" is a scale flat car that the engineer sits on while running his engine. The trucks of mine aren't aligned correctly, which puts undue stress on the axles and they simply don't roll freely. Before the run, I took them apart, and tried to figure out what's wrong. The problem is that the axle holes aren't the same distance from the bolster, which basically means that the axles aren't perpendicular to the sideframes.

Try as I might, I couldn't get the trucks back together in such a way that they all rolled freely. Looks like I need to do some work on the trucks, so I borrowed a friend's riding car for this run.

I went to the Waushakum track and fired the engine up.

During the winter, it's common practice to soak the injectors in vinegar to make sure they're clean. While I was putting the left side injector back on, one of the pipes twisted a little. Sure enough, once I opened the steam line for the injector, the line started leaking. To make matters worse, as soon as I turned off the steam, the check valve for that injector decided not to check, and the boiler started "blowing down" thru the injector.

Time to surrender for the day, after exactly 2 laps around the track…

Back home, I patched the steam line with soft solder, as I was heading to the Montreal Live Steamers meet the following weekend. I also cleaned the check valve ball and body.

After the meet, I took off the injector to clean it again. Sure enough, the patched steam line broke clean in half. Looks like I've got to make myself some time to repair the engine… Arrgh, sometimes this hobby can be a real pain in the butt.

C'ya
Mike

President's Corner

Norm Jones

President's Corner

It doesn't seem possible that the summer is half over already. As many of you know, I attend quite a number of antique machinery meets over the course of the season. The Central Massachusetts folks provided quite a nice setup for displaying models, complete with compressed air, at their annual show in Orange, MA. An 18' long manifold on about half of the tables was hooked up to an electric compressor. Low supply voltage proved to be somewhat of a problem and indicated to me that a gas powered compressor is probably more practical. I have the makings for one, and this should be an incentive to get busy and put it together.

Rolly Gaucher and I had quite a crowd at the tent on Saturday. It was good to see so many of our members who stopped by to say hello and chat. Frank Lacerenza brought over a number of fittings that can be used to put together a manifold for our next show. Thank you, Frank. I have them in my possession at this time. Any assistance in completing this project would be appreciated.

Meeting

We are fortunate to have one of our own members, Dave Bono, as the featured speaker for the August meeting. Dave's topic will be "Precision Metal Bending." Some of you may have attended Dave's seminar at this year's Cabin Fever Expo. Since I missed it there, I am very much looking forward to hearing Dave's talk.

Security

This coming month's meeting inaugurates new security procedures. If early arrivals could chat at the front door for a few minutes and pass off the responsibility of watching the door to others as they arrive, it should be relatively painless. Remember that the front door will be locked at around 7:00 with a sign indicating to walk around the building to the side door. Those of you who have to leave early need to either exit through the side door or arrange for someone to accompany you to the front door to lock it behind you. Please do not leave alone through the front door, as the door needs to the manually locked from the inside. Please also remember that under ***no circumstances*** are we allowed to park outside the side entrance.

Nametags

I must admit that I do not know everyone by name. I am probably not alone in this situation, so if you happen to have one from a previous activity kindly "put it on." I hate to address someone by the wrong name!

Show and Tell

Since we skipped a month due to July 4th falling on the first Thursday (I believe a first,) I am sure there are lots of stories to share. We will have a signup sheet available so that no one gets missed. See you on August 1st!

Norm

The Meeting

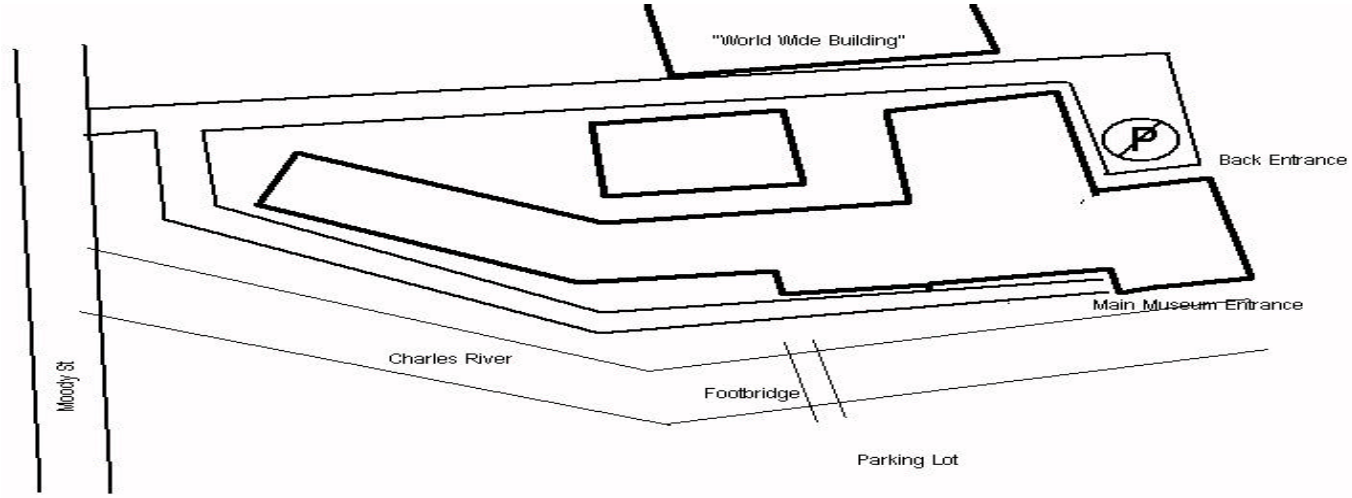
Max ben-Aaron

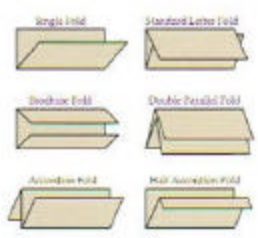
There was no July meeting! Although Norm addressed this in his column, it bears repeating. Below is the write up from June describing the new security measures.

Rob McDougall will have a sign made up which says: "NEMES Meeting in Progress. This door is locked. Please use side door on other side of Museum." At the beginning of each meeting (7:00 PM) a volunteer will be asked to take responsibility for the sign and to go down around 7:10 PM, hang it on the door and to **LOCK THE FRONT DOOR**. Since the door will be locked, members CANNOT USE THIS EXIT before the close of the meeting, as the door will not automatically lock when it closes. If you are late or must leave early, you will have to use the side door. **f** you think you will arrive late or have to leave the meeting early, you may want to consider parking in the public parking lot near the Waltham train station in front of the Waltham Commons.

Under ***NO CIRCUMSTANCES*** can we park in the area outside the side entrance door! If members park on that side of the building, residents of the apartment complex might complain about the illegal parking. If that happens, we would be forced to hire and pay for a police detail, which would be even more expensive.

For those of you who don't know where the "back door" is, here is a poorly drawn, not to scale map…





Contest - Design a paper folder

Bob Neidorff

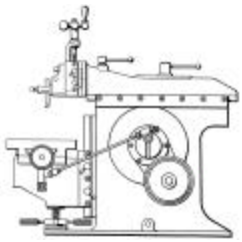
Here's a reminder about the first NEMES Design Contest!!!

This contest is to come up with the best design for a paper folder that can be made in a shop. The folder must accept a stack of between 4 and 10 sheets of paper that are stapled in the corner, and fold them twice so that they will easily fit into a standard business sized envelope.

The winner need not submit a finished working prototype, although that would be great and may assure you first place. The design can be manual, electric, pneumatic, electronic, or even computer controlled.

For more details, see the June issue of the Gazette!

Bob



Shaper Column

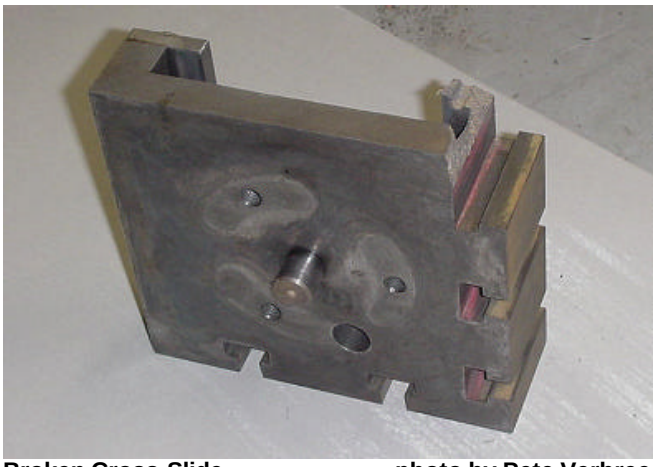
Kay Fisher

Pete Verbree's Alba 1A – Part 4

This is part 4 of the story of the acquisition and reconditioning of an Alba 1A shaper by Pete Verbree with his kind permission to publish.

Final Repairs

The last major piece that concerned me was the cross-slide. It had broken through a gib adjusting screw and along the wide portion of a t-slot.



Broken Cross-Slide **photo by Pete Verbree**

I really wasn't sure how to proceed at all. I posted a question on the news group "Rec.Crafts.Metalworking" and on the Yahoo shaper discussion group. A couple of replies came back. One suggested welding, and another suggested I ignore the damage. Neither suited me! I was afraid welding might distort the piece. I wasn't about to ignore it, having gone to this extent already.

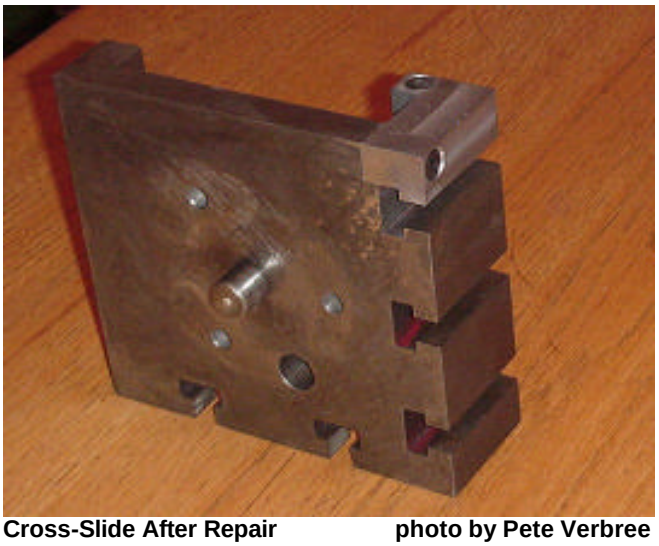
Time for some contemplation! Over the next week or so I considered my next move. The repair of the cross-slide was mostly cosmetic. It would be mostly to rebuild the broken t-slot and make the machine look like someone cared.

With this in mind I rummaged through the scrap/cutoff box and came up with a small block of cast iron bar stock. I set the cross-slide on the mill table, supported by a large angle plate, and machined away the broken corner, giving straight square surfaces to measure. The corner had broken away at the edge of the t-slot, so I set the iron block in the vise, and machined it to give me the correct overhang for the top of the t-slot plus a little more to align the new piece with an end mill.

Next I machined the slot for the slide way, machining it slightly over size (.002") so I wouldn't have to worry about scraping the sliding surface (I'm a coward.) All of the outer surfaces of the block were left proud of the originals so I could match them when the piece was assembled. I assembled the pieces with ¼" countersink SHCS and lots of Loctite.

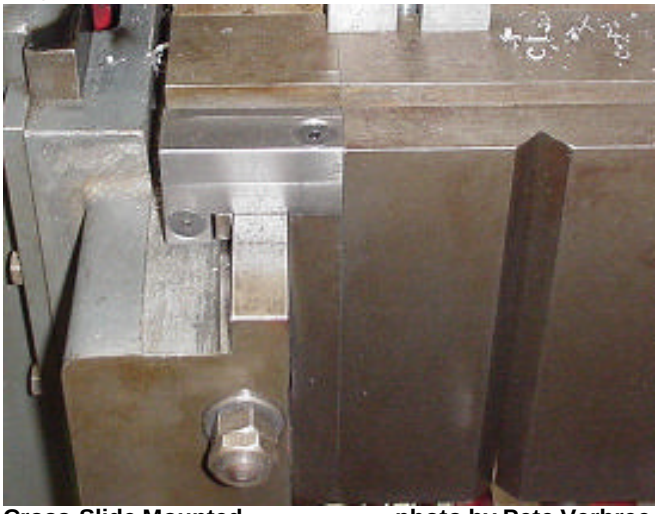
Once again I placed the part on the mill table, taking extra care to get the surfaces exactly

straight. I then milled the repair flush to the original surfaces, including the t-slot.



Cross-Slide After Repair **photo by Pete Verbree**

The last job on this piece was to drill and tap a new gib screw to replace the one where the original crack had occurred. Lookin' Good!



Cross-Slide Mounted **photo by Pete Verbree**

After some more re-assembly, it was time to turn my attention to finding a motor. According to the data plate, the Alba was originally equipped with a ¾ hp, 960 rpm, 220/440 volt, 3 phase motor. As the motor was missing when I got the machine the use of a converter was out, as was the use of any commonly available utility motors. I again turned to the Rec.Crafts.Metalworking newsgroup for suggestions. Several replied, but most of the ideas were a touch on the expensive side (variable frequency drive, DC motors.) One person suggested that I look for a 1175 rpm motor that are fairly common for fans, although a bit expensive. Now here was a workable idea.

I called around to the local motor suppliers, for a quote; about $350.00 was the reply. Are we seeing a trend here? Once again, I was forced into the scrounge mode!

Early January took me to Toronto on business for two weeks, so in my off time I hunted around. Eureka! A suitable motor was found at "Princess Auto" for $19.00. You got to love surplus stores! This motor was a little odd, having no base, an output shaft about 8" long, 1075 rpm, not reversible (luckily it turns the right way.) It is also 220 volts single phase. A base was obtained from a local woodworkers supply, which sells them to adapt motors for grinding wheels.

When I arrived home I started to work on a pulley for the motor installation. This took a little time with a calculator. The machine has two drive ratios, by belt, as well as two speeds changed by gears. This meant that I had to match the dimensions of the pulley in width and get the diameters correct so that belt changing was not a big deal. Frank Dorian had measured his pulley for me, so armed with this info I started to calculate. Based on the size of the big pulley, Frank's dimensions, the original speed and the stroke rate from the manual, I reckoned that the big pulley (input shaft) had to turn at 360 rpm at low speed. After a couple of hours and much scrap paper I figured that the pulley should measure 3.875" and 3.140". I used the info in "Machinery's Handbook" to dimension the pulley grooves.

The pulley itself was a straightforward turning job in the lathe, and I put the keyway in the bore with my Atlas shaper.

New Pulley on Motor **photo by Pete Verbree**

More assembly! Fit the motor to its new base, put on my electricians hat and do the wiring, and run to the industrial supplier for a belt.

Test Time

With the motor now installed it was time for a test run. I contained myself enough to carefully oil the machine and turn it over by hand to see that nothing was binding. So far, so good!

I disengaged the clutch and turned on the switch. Makes a whirring noise - Good! With great trepidation, I engaged the clutch. The ram started to slide back and forth! Real good!

I stopped the machine and bolted a piece of scrap to the table. I quickly ground a piece of tool bit and fitted it to the tool holder (which had been donated by Frank Dorian. Thanks Frank!)

Some quick setup of the ram position and stroke and **Off We Go!** I gingerly fed the tool down and set the cross feed to work.

Alba Lives!

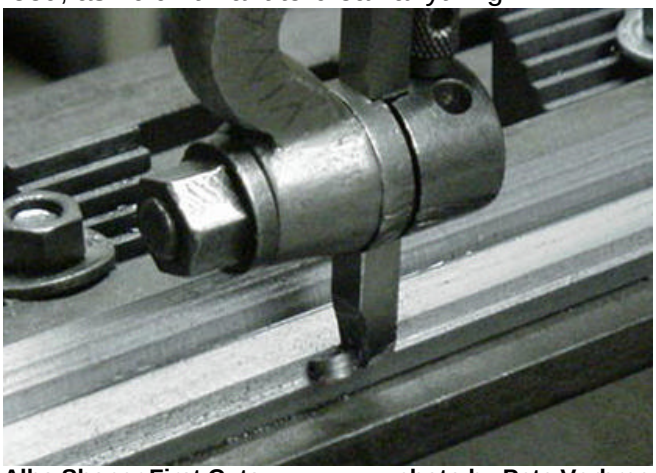
With a sound like frying eggs, she started peeling curls from the steel block. Oh Boy, Oh Boy, Oh Boy!

As I watched the machine feed across I realized that the feed was not ratcheting in the correct timing (feed on the back stroke, ratchet on the push stroke.) A little more watching, and I realized that it was 90? out of phase.

The motor also seemed to be a bit wimpy; it would only cut about .025" deep cut at .005" feed, certainly not in keeping with this category of machine. Back to the Internet and I ask more questions to the groups.

My next outing to the shop was more productive. I took the bull gear apart from it's shaft, indexed it 90?, and reassembled it. I installed a different capacitor on the motor, and adjusted the belt tension. I took care to grind the tool to match the shape recommended in one of my books, and carefully set it in the holder.

Test two produced more encouraging results. I again set the machine going and tried various depths of cut settings. I stopped at .150" at .005 feed, as I didn't want to break anything.



Alba Shaper First Cuts **photo by Pete Verbree**

The only deficiency I noted on this run was a clunking noise from the link rod assembly, when a load was applied. Previous experience with my first Atlas shaper told me what this was caused by excess clearance between the sliding block and the slot in the link arm. I measured the clearance again and was startled to find .011", not the .006" that I thought I had. So Alba's first job has been assigned, make another slide block and "Keep The Tolerance Tight"

What's Left?

At this point the machine is in useable condition. The only part that I haven't mentioned so far in this odyssey is the cover over the large drive pulley. The original was a casting 13 ½ "x 3 ½ " x 15".

The machine is quite useable without it, and as I am the only operator of the machine, safety is less of a concern. I decided to delay building one for a while so I can get on with having some fun "Making little pieces out of big pieces".

Readers might also note that I didn't mention painting during this story. My shop is heated by a wood stove this time of year (winter.) and I didn't think that spraying paint was good for my health or fire insurance policy. I elected to delay that job until summer comes. I may also have the large pulley cover finished by then.

So you ask "What did you get out of all this work?"

The answer is not as simple as saying "I now have a nice, heavy duty, small shaper". I learned that it is nice to have kind friends. I learned a few things about being resourceful; this machine would have gone to scrap if I had to try to buy all the parts to repair it. The total cost of purchase and repair is somewhere in the vicinity of $600.00 CDN. Please don't ask about the number of hours spent!

I learned to "Leave the rose-colored glasses home" next time I go to look at a machine, and I now have a few clues about how a shaper works. There is a certain pride in accomplishment when a project works out as planned (hoped for.)

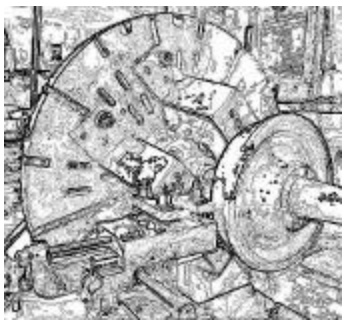
Now I can start planning some accessories to match my new machine.

Pete

Keep sending letters and email with questions and interesting shaper stories. My mailing address is:

Kay R. Fisher
80 Fryeville Road
Orange, MA 01364
Fisher@naisp.net

Kay



Shop Hints

Compiled by
Mike Boucher

Propane Burners

By Denis Edkins

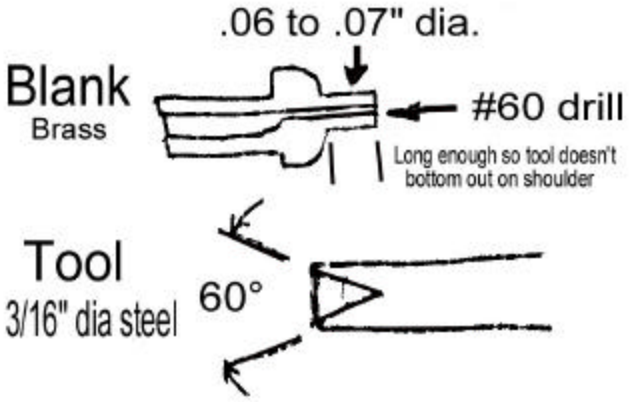
Ron Ginger asked me to pass on my method of producing very small orifice inserts for propane burners. These are very similar to those in commercial Bernzomatic ® burners. While I'm at it, I'll also pass on my very successful design for a burner. The burner was developed for the boiler for my steamboat "Marion Grace". The boat's boiler is a 3-drum water-tube boiler. Some of you may have seen it at the annual NEMES show in Waltham.

The Insert

I took an insert out of an ordinary Bernz torch and this worked OK for my prototype burner. Another insert from a second Bernz had too large an orifice, which resulted in a yellow flame. Attempts to get a spare insert were unsuccessful.

The insert is a mushroom shape. The orifice is a very small hole, much smaller than a #80 drill.

I hit upon a simple way to produce any size small hole as follows. Build a tool to "crimp" the hole.



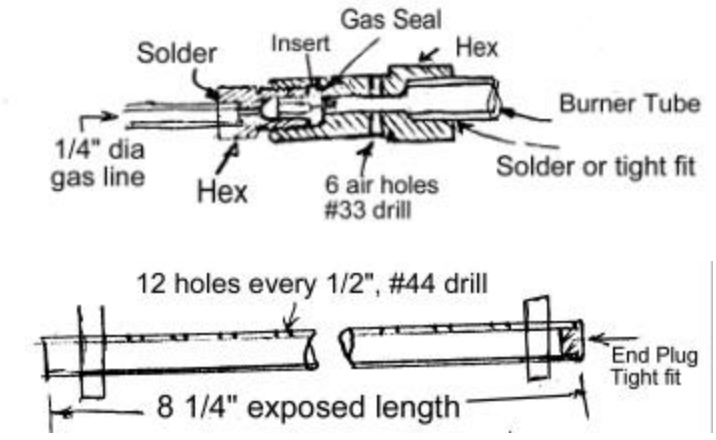
One simply mounts the tool in the lathe tailstock. With the blank rotating in a 3-jaw or collet, force the tool against the blank. This results in a smaller hole in the blank. With enough force, the hole could be completely closed, but that isn't what you're after.

It's a matter of trial and error to get the right size hole. It's best to do it in steps, since any slight eccentricity introduced by re-chucking the blank doesn't matter. In my case, I hit off the perfect hole size at the first try! If you overshoot there's not much work to do to produce another blank.

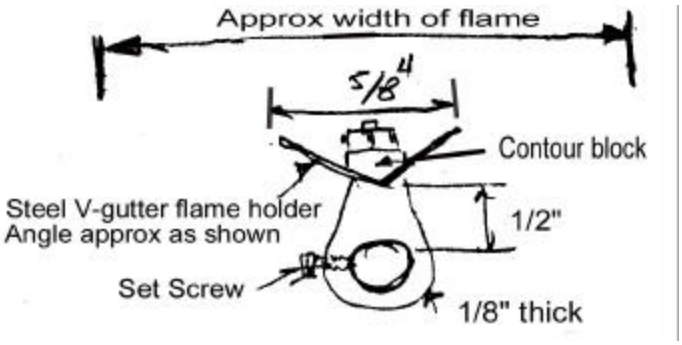
[Editors note: I purchased a similar part from Jerry Howell, who claims it has a .006" diameter hole]

The Burner

This works very well. Hopefully a picture is worth a thousand words.



It is important to note that the flame will blow out unless there is an angle steel "flameholder" This is mounted on the two brackets shown at either end of the burner tube in the above drawing. More details on the flame holder are shown here.



My particular burner has two tubes spaced 4 ¼", the spacing of the two lower boiler drums. It has two pilots of 1/8" tubing. Controlled by a simple needle valve taking gas upstream of the main radio-controlled valve and downstream of the master valve, which is simply a Bernz valve from a torch.

I can adjust the amount of flame up to the maximum merely by turning the master valve.

The pilots work very well. One adjusts the needle valve to get quite a big, yellow, sooty flame about 3"-4" long. As soon as the main valve is opened, the pilot flames drop to a mere 3/8" or so because of the pressure drop.

The main valve is from Coles' Models in Ventura, CA. It is the only one I have found with the proper travel (90 degrees) and the low torque compatible with the standard Futaba servo. It is made with a rotating ball sealing on a teflon seat, hence the low friction. It will take the head of my superheated steam as well.

I can supply a drawing of the pilot needle valve if desired. It's nothing special but it works very well.

Denis

Editors Note: Propane is inherently dangerous. A small leak can lead to disaster! Use your own good judgment when building propane burners. Follow the advice in this article at your own risk! The author, the editor, and NEMES can NOT be held accountable for any injury to yourself or innocent bystanders due to improperly constructed propane burners.

Moving Machinery

By Dick Boucher

Recently, Michael has had a lot of communications on the list concerning moving machines. The picture is of a Cincinnati No 2 miller being moved down the slope in the back yard at the house I used to own in South Groveland.

When I bought the machine, it was too tall to fit in the cellar area I was using for a shop at the time so I had it delivered to the area by the garage while I lowered the cellar floor about a foot with a pick and shovel and re-pored the cement floor mixing the cement in a wheelbarrow. That is another story, but I wish I still had that kind of energy.

I had to store the machine outside as the garage wasn't finished at the time. I covered every finished surface with wheel bearing grease and covered that with Saran Wrap then covered the machine with a canvas tarp. This did an excellent job protecting the machine.

Moving Cincinnati Miller **Dick Boucher Photo**

In the picture the miller is on a pallet of 4x4 oak. A pallet is always a good idea when moving a machine as it increases the stability of the machine by giving it a larger footprint. The rails are the same 4x4 oak.

They were pallets that the fabricator used to ship equipment bays to the Western Electric Company where I used to work. Back in those days employees were allowed to put their name on a list and when your turn came up you could take a pickup load of the wood. These pallets gave me a good stable runway for the machine to move over.

The machine is on pipe rollers. The pickup is being used as an anchor and a block and tackle was used to lower the machine slowly down the runway.

This was a very successful one man move and soon the mill was in position replacing my 12x12 crank arm planer. The old Cincinnati provided many hours of service and followed me to my present shop where it was finally replaced by a Bridgeport.

Dick

Flat Belts

By Jay Stryker

I have been putting together another leather flat-belt drive project and found two rules of thumb which might assist others with vintage machinery:

?? A belt will transmit one horsepower per inch of width at a speed of 1000 feet per minute

?? For a single ply belt with light-duty lacing, the belt tension is about 30 lbs. per inch of width

Jay

Treasurer's Report

Rob McDougall

Balance as of: 5/31/02	**$5,380.61**
Donations	
- Jim Paquette	50.00
- James Conery	24.00
Dues Received	137.50
Proceeds from CD Sales	35.00
Interest Income	.65
Less	
Gazette expense	-183.06
Front door security (May)	-50.00
Balance as of: 6/30/02	**$5,394.70**

Rob

For Sale

Shaper Work CD

Put out in 1944 by the New York State education Department this 326 page manual is chock full of valuable tips and information on using the King of Machine tools....The Shaper. Covered is everything you need to know about the care and feeding of the shaper, use of the shaper, even how to sharpen tools for the shaper. Scanned and saved in Adobe Acrobat format. $5.00 shipping included.

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

Metalworking Books on CDs

I found three old books and three new books on the web. All are in the public domain and had good information on using and maintaining metalworking tools. The old books are high-resolution scans, so they take up a lot of bytes. It took me hours to download them from the web, so the best way to make them available is by CD-ROM. Here are the titles on this CD-ROM:

- Modern Machine Shop Practice Vol I, Joshua Rose 1887
- Modern Machine Shop Practice Vol II, Joshua Rose 1887
- The Advanced Machinist by William Rogers 1903
- Machinery Repairman - US Navy 1993
- Fundamentals of Machine Tools - US Army 1996
- Welding Theory and Applications - US Army 1993

$5.00 shipping included. Profits go to the club treasury.

Bob Neidorff
39 Stowell Road
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Neidorff@TI.com

Milling Machine

Small duplex. 90% of scraping still visible. 5" x 20" unmarked table with 3 "T" slots. Modern electronic variable speed drive, single phase motor. Many collets. $475

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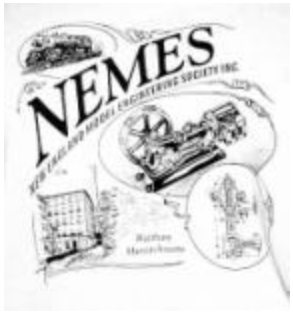
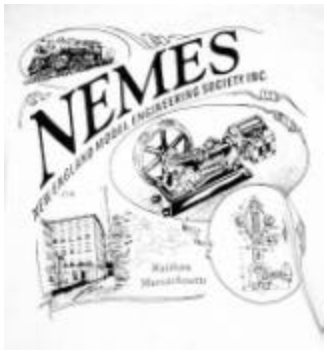


NEMES clothing

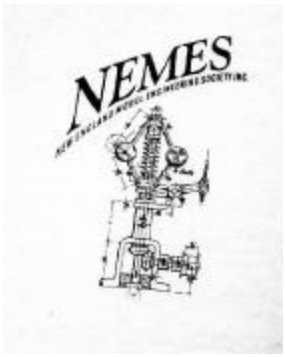
NEMES Tee Shirts

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.

Artwork:



Rear



Front

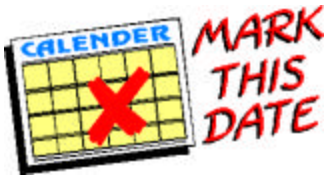
Prices:

S, M, L, XL	$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
295 River St
Waltham, MA 02453-6007
bandm3714@attbi.com



Upcoming Events

Bill Brackett

Aug 1 - NEMES Monthly club meeting

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

Aug 2-3 - Scribner's Mill engine show

Sebago-Long Lake Region near Harrison, ME. (207) 583-6455

Aug 10-11 - Straw Hollow Engine Show

Boylston Ma J. A. Resseguie (508) 869-2089

Aug 10-11 - Marine Engine Show

Steam and gas marine engines only! Mystic Seaport, 67 Main St Essex, CT. (860) 526-5829

August 10-11 - 28th Annual Transportation & Aerobatic Spectacular

Owls Head Transportation Museum, Owls Head, Me

Aug 14-17 - Rough & Tumble Show

Kinzers, PA (717) 442-4249

Aug 18 - MIT Flea Market

9AM to 2PM Vassar St Cambridge MA
(617) 253-3776 between 9-5 M-F

Aug 23-25 - Waushakum Annual meet

Waushakum Live Steamers Holliston, MA
Mike Boucher (781) 893-3892

August 24 - 25th Anniversary New England Auto Auction

Owls Head Transportation Museum, Owls Head, ME

Aug 31-Sept 1 - Pioneer Valley Live Steamers 50th Anniversary Meet

Southwick, MA
www.pioneervalleylivesteamers.org

September 1 Antique Motorcycle Festival
Owls Head Transportation Museum, Owls Head, ME

Early Sept - Lee's Mills Steamboat Meet.
Lake Winnipesaukee, Moultonboro NH
(603) 476-5617 Usually runs for about a week! Call for exact dates.

Sept 5 - NEMES Monthly club meeting
7PM, Charles River Museum of Industry, Waltham, MA. (781) 893-5410

Sept 6-8 - GSG&SEA Dublin Engine Show,
Dublin NH (603) 495-3640

Sept 12-15 - Fitchburg Show
Fitchburg Airport, MA
Dana Hill (978) 537-1108

Sept 14-15 - Chester, NH engine show
121 Derry Rd. RT 102 Jay Wilkie (207) 748-1092

Sept 15 - MIT Flea Market
9AM to 2PM Vassar St Cambridge MA
(617) 253-3776 between 9-5 M-F

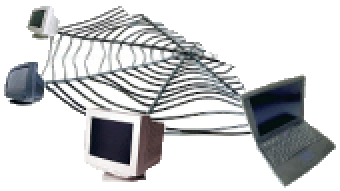
Sept 21 & 22 - Pioneer Valley Live Steamers Fall Meet
Southwick, MA
www.pioneervalleylivesteamers.org

Sept 21-22 - Cranberry Flywheelers Engine Show
Eadaville RR. David Moore (508) 697 5445

September 22 - Tribute to Convertibles
Owls Head Transportation Museum, Owls Head, Me

To add an event, please send a brief description, time, place and a contact person to call for further information to:
Bill Brackett
wbracket@rcn.com
(508) 393-6290.

Bill



Web Sites of Interest

Spare Time Labs
Info on a homemade iron melting furnace.
http://members.surfeu.fi/sparetimelabs/

Piston Rings
How to make your own, based on the work of Prof. Chaddock (the Quorn) and Tom Walshaw (Tubal Cain)
http://www.btinternet.com/~sylvestris/rings/rings.htm

Dockstader valve gear programs
Now the standard for "freeware" steam valve gear design programs. Been around seemingly forever, but Charlie has made some updates, including some new valve gears.
http://www.tcsn.net/charlied/

1840s Magazine page Scans
Scans of several pages of "*The Practical Mechanic and Engineer's Magazine*" (1841-42). Articles on a "Tellurium" (a mechanical device to show the orbit of the moon) Slide steam valves, and a new steam engine from Maudslay. Very interesting stuff from over 150 years ago.

http://www.marcdatabase.com/~lemur/temp/pmem.html