

# The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

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## Editor's Desk

Frank Hills

### How to Make a Computer Chip with a Handsaw

Let me say right off that I have no intention of actually making a computer chip with a handsaw. I came up with the title for this month's article one day while trying to explain to a local machinist that he couldn't know a thing couldn't be done until he had tried it. Where I work we're always pushing the limits of what can and can't be done. It continually amazes me what you can do when you spend the time to think about it. That's what technology is all about. It's not magic that you can make a tool better than the one you made it with, it's technology. If that weren't true, we'd all still be using broken tree branches as clubs.

As people who like to get our hands dirty and make things, we don't think of technology as the hard drive in our laptops or the turbo in our cars. It's the collective experiences and capabilities of man that make these things possible. It's putting seemingly unrelated ideas together to see if they'll work in new ways. For example, the air bearing has been around for a long time. One day someone got the idea of using the concept to overcome the microscopic roughness on machine ways. It's an expensive system, but that simple cushion of air increased machine accuracy

Continued on page 2

## Next Meeting

Thursday, Feb 5th, 2009

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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## Editor's Desk

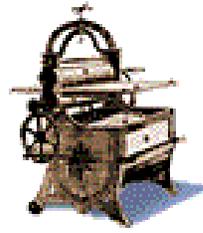
-continued from page 1

for those who needed it 10, 100, even 1000 times (10 for CNC machine tools, 1000 for computer chip assembly machines). At first, they thought it couldn't be done. Air, even at high pressures, is "spongy"; it would give and make the system useless. But the naysayers were wrong. That layer of air could be injected into gaps smaller than mechanical adjustment allowed. And at high pressures distributed over large areas, the air supported structure became as rigid in space as the metal structure itself. All this and with lower friction too! It was an old idea used in a new way, and it worked

And technology doesn't necessarily mean complex and expensive. I worked for MIT at their nuclear research facility for years. We had to locate sensors, magnets and other pieces of equipment with incredible accuracies. It was easy. We made adjusting links using two threaded rods with a union nut between them. One thread was, say, 40 threads per inch and right handed. The other was 41 and left handed. When the union nut was turned it looked like nothing was moving, but after a full 40 turns, the overall length of the linkage had changed by  $\frac{1}{41}$  of an inch. That's .00061 inches per full turn of the union! No, technology doesn't have to be complex or expensive. You just have to think.

Of course there are technologies that are well over the average persons head, but they were all founded on some previously available groundwork. You can't start from absolute scratch and build an atom bomb. So what makes technology something many people fear? Is it stubbornness, clinging to the old tried and true, and ignorance? I think it's probably more a lack of imagination with a little laziness thrown in for good measure. After all, to a large extent, technology is just taking what we've already done and trying something new with it. At least, that's where it starts.

Next month "I can't let you do that, Dave." Or "Will Computers Ever Think for Themselves?"



## NEMES Gazette Editorial Schedule

Issue	closing date for contributions
Feb '09	Jan. 21, 2009
Mar.'09	Feb. 18, 2009
Apr. '09	Mar. 18, 2009
May '09	Apr. 22, 2009



## President's Corner

Dick Boucher

## The Meeting

Well, as you have likely found out, there was no meeting scheduled for January as it was New Years Day.

## Miscellaneous Ramblings

The winter has definitely gotten of to a rousing start, with the opening ice storm and prolonged power outages for some folks. Mike, Karen, James and Noah (the dog) had to spend a night with us because of the storm and they had a few overnight guests from their town when they got their power back. Then we have had three snow storms of appreciable accumulation, so the old Gravely with the snowblower attachment has been getting a good workout.

We have finally gotten the minimum number of folks to ride the bus to York PA, so we definitely going to Cabin Fever again this year. All we have left to worry about is the weather. There are still a few seats left on the bus. It is a great time and you get to meet some really great builders in the country, and see and hear their engines. Time is short so if you decide to go, send a check to Dick Koolish and let Norm Jones (978-256-9268) or me (978-352-6724) know so we can get you on the list and get the instruction letter to you. For those already signed up, the letter should be in your mailbox this week.

My son Michael sent out a Christmas card showing grandson James fiddling with the reverse lever on my Tom Thumb locomotive. It is almost the same candid picture I took of Michael back when I was building the engine. I will have to spend some time going through

my pictures to see if I can find the picture of Michael to have the two pictures together when I show the engine at various shows.

As soon as we return from Cabin Fever, it will be time to start putting things together for our own show on February 21<sup>st</sup>. So get out your brass polish and engine wiping cloths, and get a handle on preparing for our own great event because we, if I may be allowed to brag, have our share of really great builders in our own society.

The February meeting will be a Poster Session so it will be a good chance to show off some of the winter projects.

It is now Friday afternoon and the stove is cranking out a bit of heat down here in the shop and it isn't snowing, so I think I will spend a while working on my P.M. Research steam engine before some folks come over to see my Christmas Railroad under the Christmas tree. It is "G" gauge and a bit whimsical but if anyone would like to visit, give me a call at the above number to see if I am home.

One last thought, the "Frodo" project continues to be a great success. For those who may not have been following the project, four fellows started coming over to my shop last January and started to build five 0-4-0 locomotives designed by Charles Purington back in 1982. We now have all the tenders finished and one chassis assembled with the wheels, side rods, valve gear girders, axle pump and almost finished cylinders installed with enough parts to have all five chassis at that point in the construction. Oh yes, four constructors, five locomotives---I get one at the finish. We are probably going to start on the boilers soon, so we can use the wood stove to anneal the copper sheets for forming. It has been a great experience for me watching two boys and one a fellow bit older go from never having read a micrometer or caliper and needing my total instruction to a bunch of guys who can be handed a drawing and then go and find some stock and make parts while I enjoy the evening, usually programming parts to be machined in the CNC milling machine.

Charlie Purington is now living in an assisted living situation with his wife but one of the fellows swings by and picks him up and he joins us totally enjoying being sprung for the evening. Along with Charlie, occasionally other of the older members of the North East Live Steamers are picked up and join us in the shop. It has been a great year and we are looking forward to more enjoyable evenings.

Dick B.

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## ***The Steam Man of the Prairies.***

BY EDWARDS ELLIS,

### **CHAPTER XI.**

#### **THE STEAM MAN ON A BUFFALO HUNT.**

WITH a wild snort of alarm, the three buffaloes turned tail and dashed over the prairie, with the shrieking steam man in pursuit.

The boy had taken the precaution to bring a rifle with him. When he saw them flee in this terrified manner, the thought came to him at once that he would shoot one of them, and take a portion back to his friends for their supper.

It would be a grand exploit for him, and he would be prouder of its performance than he was of the construction of the wonderful steam man.

The lumbering, rolling gait of the buffaloes was not a very rapid one, and the boy found himself speedily overhauling them without difficulty. They did not know enough to separate, but kept close together, sometimes crowding and striking against each other in their furious efforts to escape.

But, after the chase had continued some time, one of the animals began to fall in the rear, and Johnny directed

his attention toward him, as he would be the most easy to secure.

This fellow was a huge bull that was slightly lame, which accounted for his tardiness of gait. Frightened as he was, it was not that blind terror which had seized the Indians when they discovered the steam man so close at their heels. The bull was one of those creatures that if closely pressed would turn and charge the monster. He was not one to continue a fruitless flight, no matter who or what was his pursuer.

The boy was not aware of this sturdy trait in the animal, nor did he dream of anything like resistance.

So he steadily drew toward him, until within twenty yards, when he let go of his controlling rod, and picked up the rifle beside him. A bullet from this, he supposed, would kill any animal, however large, no matter at what portion of his body he aimed.

So raising partly to his feet, and steadying himself as well as he could, he aimed for the lumping haunch of the animal. The ball buried itself in his flank, and so retarded his speed, that the next moment the boy found himself beside him.

The instant this took place, the bull lowered his head, and without further warning, charged full at the steam man.

The boy saw the danger, but too late to stave it off. His immense head struck the rear of the monster with such momentum that he was lifted fully a foot from the ground—the concussion sounding like the crack of a pistol.

Fortunately the shock did not materially injure the machine, although the frightened boy expected to be capsize and killed by the infuriated buffalo.

The latter, when he had made his plunge, instantly drew back for another, which was sure to be fatal if made as fairly as the first. The boy retained his presence of mind enough to let on full steam, and the concern shot away at an extraordinary rate, bounding over the ground so furiously that the billets of wood were thrown and scattered in every direction, so that now, from being the pursuer, he had speedily become the pursued. The tables were turned with a vengeance!

It was only by providential good fortune that young Brainerd escaped instant destruction. The wonder was that the steam man was not so injured as to be unable to travel, in which ease the maddened bull would have left little of him.

As it was, the experience of the boy was such as he could never forget. When he turned his affrighted glance behind he saw the enraged animal plunging furiously after him, his head lowered, his tongue out, his eyes glaring, and his whole appearance that of the most brutal ferocity.

Had the bull come in collision with the horse or man while in that mood he would have made short work of him.

But great as was his speed, it could not equal that of the wonderful steam man, who took such tremendous strides that a few minutes sufficed to carry him beyond all danger.

Johnny quietly slacked off steam, but he kept up a good swinging gait, not caring to renew his close acquaintance with his wounded enemy. The latter speedily discovered he was losing ground, and finally gave up the pursuit and trotted off at a leisurely rate to join his companions, apparently none the worse for the slight wound he had received.

As soon as the boy found himself beyond the reach of the animal's fury he halted the man and made a minute examination of the machinery.

The head and horns of the buffalo had dented the iron skin of the steam man, but the blow being distributed over a large area, inflicted no other damage—if indeed this could be called damage of itself.

The boy was greatly pleased, not only at his escape but at the admirable manner in which his invention had borne the shock of collision. It gave him a confidence in it which hitherto he had not felt.

Turning his face more toward the mountains, he again let on a good head of steam and rattled over the prairie at a stirring rate. An hour was sufficient to bring him to the base, where he halted.

He had not forgotten the warning of the trapper, but, like almost any inexperienced person, he could not see any cause for alarm. He scanned every part of the prairie and mountain that was in his field of vision, but could detect nothing alarming.

He supposed the parting admonition of Baldy was merely a general warning, such as a cautious person gives to one whom he has reason to fear is somewhat careless in his conduct.

It therefore required little self-argument upon his part after putting his man in proper "condition," to start off on a ramble up the mountain side. It was not his intention to remain more than an hour or so, unless he came across some game. He had a goodly quantity of ammunition, and was careful that his rifle was loaded, so as not to be taken unawares by any emergency.

Although Johnny Brainerd was afflicted with a misshapen form, yet he was very quick and active upon his feet, and bounded along over the rocks, and across the chasms like a deer, with such a buoyancy of spirits that he forgot all danger.

However, he had gone but a short distance, when he was startled by a low fierce growl, and turning his head, saw to his horror, that he had nearly run against a colossal animal, which he at once recognized as the dreaded grizzly bear.

Such a meeting would have startled an experienced hunter, and it was therefore with no steady nerve that he hastily brought his piece to his shoulder and fired.

The shot struck the bear in the body, doing just what his shot at the buffalo had done some time before. It thoroughly angered him, without inflicting anything like a

serious wound. With a growl of fury the brute made straight for him.

What would the boy have given, as he sped down the mountain side, were he now in his wagon, whirled over the prairie at a rate which would enable him to laugh to scorn any such speed as that of the brute.

At first he had hopes of reaching his refuge, but he was not long in seeing that it was impossible, and found that if he escaped he must find some refuge very speedily.

When he suddenly found himself beneath a goodly-sized tree it looked like a providential indication to him, and throwing his gun to the ground, he ascended the tree in the shortest time that he had ever made.

He was none too soon as it was, for the bear was so close beneath him that he felt the brush of its claws along his feet, as he nervously jerked them beyond its reach.

Hastily scrambling to the very top of the tree, he secured himself among the limbs, and then glanced down to see what his enemy was doing. Great was his relief to find him sitting on his haunches, contenting himself with merely casting wistful glances upward.

The sensation of even temporary safety was a relief—but when a full hour had dragged by, with scarcely a single change of position upon the part of the brute, Johnny began to ask himself what was to be the end of all this.

It looked as though the grizzly had resolved on making his dinner upon the youngster who had dared to fire a shot at him. The patience of an animal is proverbially greater than that of a human being, and that of the bear certainly exceeded to a great degree that of his expected prey who crouched in the limbs above.



## Shop Tips

### Removing A Stuck Threaded Lathe Chuck

My Logan lathe came with a Buck 3-jaw chuck threaded onto the spindle. The previous owner, a vocational school, taught students to remove the chuck by inserting the chuck key into the pinion gear hole, engaging both belt drive and back gear drive, and banging down on the key. Repeated use of this crude method left the pinion gear square-drive hole badly bell-mouthed and nearly unusable.

After years of frustration, I disassembled the chuck, removed the pinion gear, milled the hole to a larger square with a tiny endmill, and milled a new chuck key to match the new hole. Then I swore to never use that chuck removal method again.

Now every time that I install the chuck, I thread it on very gently so that it will come off easily. Still, after a few deep or vibrating cuts, the chuck is stuck on again. Scott Logan gave this advice for safe, easy chuck removal.

First, unscrew the chuck from the backplate. In my case, I remove 6 Allen screws.



With the chuck off, you see a bare backplate.



Step two is to drill two holes in a scrap long metal bar, with the spacing of two backplate mounting holes. In my case, the scrap is 36"x2"x1/2" and the screws are 1/4-20, so I drilled 5/16" holes. Next, bolt the scrap to the backplate, as shown below. This makes a great lever for twisting the backplate, and puts the torque very close to the threads, minimizing the risk of bending the spindle.



Finally, engage both back gears and belt drive, and push down on the end of the bar.



It won't take much force on the long bar to unscrew the backplate, even if it's on very tightly. Just make sure that you don't tip over the lathe!

I call this technique "upchucking", but whatever you call it, this may be the gentlest way to remove a stuck chuck from a threaded spindle.

Many thanks to Scott Logan for this great tip!

*Bob Neidorff*



*For Sale*

### ***Milling attachment for a South Bend lathe***

Suitable for 9" or 10" lathes. Approx. 5 1/2" tall. Casting # 827NK1. It has the handle but not the little "V" blocks. Excellent condition, with original paint. These are selling on ebay for \$400+. I'd like the BRO over \$150.

[hwevers@charter.net](mailto:hwevers@charter.net)

### ***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](mailto:errol.groff@snet.net)



*Interesting  
Internet  
Sites*

If you are new to machining, or want to learn more, check out these interesting instructional internet sites.

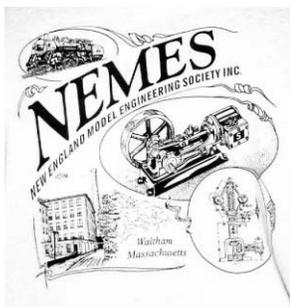
- <http://its.fvtc.edu/MachShop1/Default.htm>
- <http://its.fvtc.edu/MachShop2/Default.htm>
- <http://its.fvtc.edu/MachShop3/Default.htm>
- <http://its.fvtc.edu/MachShop4/Default.htm>
- <http://its.fvtc.edu/MachShop5/Default.htm>
- <http://www.sherline.com/grinding.htm>

## 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

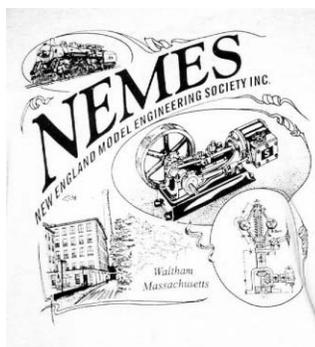


*NEMES*  
clothing

## 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

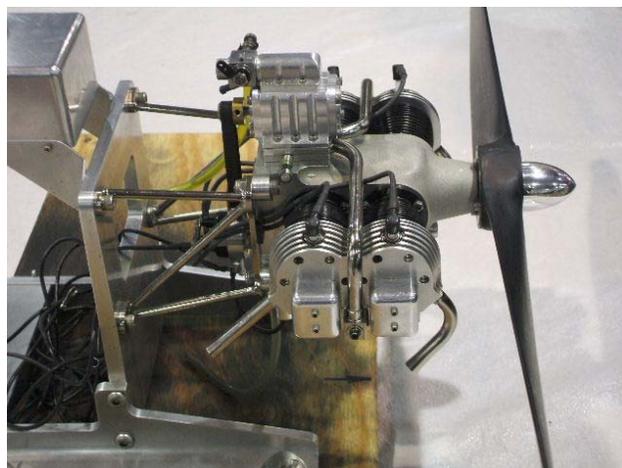
## Prices:

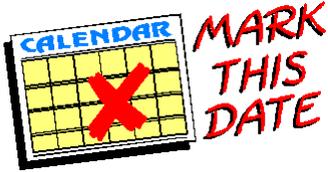
	Tee Shirts	Sweat Shirts
S - L	\$12.00	\$22.00
XXL	\$14.00	\$24.00
XXXL	\$15.00	\$25.00

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](mailto:mdbouch@hotmail.com)





## Upcoming Events

Bill Brackett

Feb 26<sup>th</sup> - 28<sup>th</sup> – FIRST Robotics Competition  
Verizon Wireless Area  
555 Elm Street  
Manchester, NH

<http://www.baesystemsfirst.org/regional/when.htm>

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](mailto:thebracketts@verizon.net) or (508) 393-6290.

*Bill*

### *Calendar of Events*

Jan 1<sup>st</sup> New Years day run  
Wauhakum Live Steamers  
Halliston MA.

<http://www.steamingpriest.com/wls/>

There will be no NEMES meeting in January

Jan 16<sup>th</sup> - 18<sup>th</sup>  
Cabin Fever Expo Bus trip  
Dick Boucher 978-352-6724

Jan 24<sup>th</sup> - 25<sup>th</sup>  
Amherst Railway Society Big Railroad Hobby Show  
Eastern States Exposition, West Springfield, MA.

<http://www.amherstrail.org/>

Feb 5<sup>th</sup> Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry  
Waltham, MA  
781-893-5410

<http://www.neme-s.org>

Feb 21<sup>st</sup> Saturday 8:00AM-4:00PM  
13<sup>th</sup> Annual NEMES Show  
Charles River Museum of Industry  
Waltham, MA  
781-893-5410

<http://www.neme-s.org>

<http://www.crimi.org/>