

# The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

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## Editor's Desk

Frank Hills

### *If Your Friend Sat on a Rocket Would You Do It?*

I've been involved in a great many hobbies in my life. Some have lasted to this day, others faded fast. I get bored very quickly with any hobby that requires you purchase a kit to assemble. Plans are OK, as is buying a package of raw stock with them. But kits that are just "snap it out and glue it" won't entertain me for long. Model rocketry was like that for me. I only built two kits before I started designing my own rockets from scratch. But that didn't last either. What I was really interested in was the engines. I spent years playing with those. And I was proud of myself, too. Solid fuel, liquid fuel, hybrids, as long as it made noise, I was happy. But that's kid stuff compared to what some people are doing. I'm not talking about those whom have moved on from model to amateur rocketry. Those are just models on steroids. I'm talking about the builders who show up in the New Mexico desert every summer and have direct radio contact with the local airport so they don't accidentally shoot down a passenger jet. These fanatics sometimes set world records for weight lifted (1,648 LBS to 4,440 ft), altitude reached (77 miles) and maximum thrust attained (36,200 LBS). They're still amateurs, but you'd be surprised how far some of them are willing to go.

## Next Meeting

*Thursday, June 4, 2009*

7:00 PM. Meetings held at:  
Charles River Museum of Industry  
154 Moody Street  
Waltham, Massachusetts

## Membership Info

New members welcome! Annual dues are \$25 (mail applications and/or dues checks, made payable to "NEMES", to our Treasurer Richard Koolish, see right) Annual dues are for the calendar year and are due by December 31<sup>st</sup> of the prior year (or with application).

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

Addresses are in the left column.

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## Editor's Desk

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At the amateur level, guidance systems are forbidden; even to assist the rocket in maintaining a straight-up course. It doesn't take a great deal of imagination to understand why. But that doesn't stop the most hard core of this crowd. There are permits that can be obtained and agencies you can contact if you really have the need to step over the line with your creation. And many have. There are now several startup companies trying to compete with NASA for the small experiment launch business. Many universities and small businesses want to put experiments into space. Not necessarily into orbit, just over the atmosphere. At last count, NASA charged more than \$100,000 a pound to do so and there's a long waiting list. These startups, at least two of which are run by engineers with no direct experience in the field, believe they can do so for between \$1000 and \$10,000 a pound...eventually. And they plan to do it almost at your convenience. It isn't as far fetched as it sounds. Many amateurs have exceeded the 30 mile altitude mark. Several have hit 40 miles. To date there is only one who has exceeded the gold standard and entered "space" at 60 plus miles. But before you judge too harshly and say "that's because they're amateurs", understand this, most amateur rockets fail to reach their planned altitude because they didn't fly straight long enough. It wasn't engine failure, poor design or faulty construction. It was lack of attitude correction to counter wind, balance on takeoff, and the effects of supersonic flight. Today you can buy gyro stabilizers for model airplanes for little money. How much of a stretch would it be to adapt one for use on a rocket? With permits in hand and contacts made, these startups are being a little more professional than that, but making a rocket and putting it into space doesn't seem so far-fetched now, does it?

Believe it or not, these people are at the bottom of the "space business" food chain. You may have heard of the X-prize. It was a contest. The winners would take home \$10,000,000 if they could put a person into space (remember, 60 miles). The rules were a bit more stringent than that, but the prize was won. The winners were Dick Rutan and his team. Not exactly an amateur, Dick does have a degree in Aeronautical Engineering. He's also famous for building the first plane to fly un-refueled around the world and several other accomplishments of merit. But he wasn't alone in the attempt. There were several well funded teams who are now working toward fulfilling the potential "space tourism" business. This is no pipe dream. Modern off the shelf

technology makes it entirely possible and potentially profitable. More interestingly, NASA, Rocketdyne, and the Air force aren't involved in any way. All of these groups are considered amateurs because they don't make their living doing this and few have educational backgrounds in the field. Of course, if they succeed, they'll then be professionals...professional space tour guides!

Of course there are also those at the other end of the spectrum. The gent responsible for Evil Kenevils Snake River jump was designing a rocket. His area of expertise is steam rockets, great big, high pressure steam kettles with controlled valves. Let the steam out, the pressure drops and more water flashes into steam until it's spent. His previous designs powered drag racers and the like. It sounds like a stunt, but they work surprisingly well, if inefficiently. There's also the guy who invented the Mattel water guns which are so popular at kids' pool parties. He never graduated high school, but he's a millionaire. His entry was a gigantic water rocket. He built the "main booster" out of fiberglass then disappeared out of media view. I wonder if he went back to school. There's also a group with a slightly more inventive approach. And it's already making money. They buy cheap weather balloons by the box load and tie them to light aluminum frames. Corporate advertising and cameras are attached to the frames and when the structure reaches an altitude high enough to see the earth's curvature, they start snapping pictures. They recently started taking the next step which was to hang an amateur rocket from the frame. At maximum altitude the rocket is launched. With a camera in its nose and near zero aerodynamic drag, these rockets can attain great heights. Again, with the addition of auto-stabilization and, perhaps, multiple stages, they too hope to hit the edge of space. And they might do it more easily and inexpensively than the competition!

Considering that the art/science of rocket building was started by amateurs in the first place, I guess we shouldn't be surprised how far a little talent, experience and interest can take you. The most successful builders of early aircraft and submarines were also amateurs. But if you decide to build one, don't expect me to take the first ride on it for you. I'll watch from the safety of the nearest bunker.

Next month, "Specialty Machining Techniques."





## ***NEMES Gazette Editorial Schedule***

<u>Issue</u>	<u>closing date for contributions</u>
June '09	May. 18, 2009
July '09	June. 22, 2009
Aug '09	July 27, 2009
Sept '09	August 21, 2009



## ***President's Corner***

Dick Boucher

### **The Meeting**

First let me give a heart felt thanks to Frank Dorion for stepping up to the plate on such short notice and giving us an absolutely great talk on spring winding and showing us the Di-Acro spring winder. Is anyone out there contemplating building such a machine for their shop? It might be a great project for a number of fellows to get together on. First do a little design work, then build a few prototype winders, and publish plans in the Gazette – like Norm's Sterling Cycle engine. Give it some thought.

This month Frank Defio is back on schedule with his shop work so he will be talking to us about his company Dif-e-yo YoYo's

### **Miscellaneous Ramblings**

Last month I was mentioning that it was 88 degrees and too hot to be working outside. Well this month it is 48 degrees and drizzling and literally too lousy to be working outside so I continue to enjoy my shop even though I had to turn on the heat. Like Mark Twain said, in New England, if you don't like the weather wait an hour, it will change.

Last weekend, a half dozen fellows from the North East Live Steamers moved a 280-foot highline duel gauge (2-1/2 and 3-1/2, Dave Stickler take note) live steam track from Charlie Purington's yard in Byfield to my yard here in Georgetown. Charlie and his wife Barbara have reached the assisted living stage of life and his home will be sold soon. The question was – what would happen to the track? Knowing the size of

my back yard, the president of NELS approached Charlie and me about the move. Both parties thought it would be a good idea so the entire move was done on Saturday. The track was cut into 20-foot sections, loaded onto a trailer and re-setup in my yard in 11 hours. We started at Charlie's at 9:00AM and were riding the track on flat cars pulled with by rope at 8PM that evening.

Monday Memorial Day we had a gold spike ceremony with a real 24-karat scale spike and two 3/4-scale locomotives touching pilots. This was historically the first time that steam locomotives had operated in Georgetown since 1941.

I was interested in the web article " People Doing Strange things With Soldering Irons" submitted by Dick Koolish on the Willoughby and Baltic group he belongs to having thought such a group would be great in the Model Engineering community. My experience with the Frodo locomotive building project seems to indicate that such a group could be workable. The only problem is the expense of having shop space, machines and tooling available.

Now for a totally miscellaneous rambling I just found out how to make a smiling face and a frowning face on my computer. ☺ ☹

Dick B.





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

BY EDWARDS ELLIS,

### **CHAPTER XVI.**

#### **THE REPULSE.**

A FEW minutes more satisfied the trapper that he was right. Gradually out from the darkness the approaching figure resolved itself into the steam man.

Johnny Brainerd, after leaving the huge trapper so neatly, continued wandering aimlessly over the prairie at a moderate speed, so as to guard against the insidious approach of the Indians, or the hunter who had threatened to confiscate his property in so unjustifiable a manner.

Fortunately he did not see Baldy until the latter cautiously hailed him, otherwise he would have fled before ascertaining his identity; but the moment he recognized his voice he hastened toward him, no less surprised than pleased at meeting him so unexpectedly.

"Where are Mickey and Ethan?" he inquired, as he leaped alongside of him.

"In the cave."

"How is it you are here?"

The trapper briefly explained that he had crept out to hunt him up; but as there seemed no imminent danger, he deemed it best to leave his companions there, as if the Indians once gained possession of the golden ravine, it would be difficult, if not impossible, to displace them.

Besides, in order to carry out the scheme which he had formed, it was necessary that two at least should remain in the cave, while the others were on the outside.

Under the direction of the trapper, the steam man slowly approached the ravine, keeping at a respectful distance, but so near that if any sudden emergency should arise, they would be able to render assistance to their friends.

The boy gave several whistles so as to inform the Irishman and Yankee of their whereabouts. A few seconds after, and while the noise of the instrument was echoing over the prairie, a fainter whistle reached their ears.

"That's the long-legged Yankee!" instantly remarked the trapper; "he knows how to make any kind of noise."

"What does it mean?"

"It means that all's right."

"Where are the Indians?"

"They ain't fur off. I wish they war further, fur ef it warn't fur them, we'd had half the yaller metal out of thar by this time."

Young Brainerd had the reputation of possessing a remarkably keen vision; but, peer us much as he might, he could detect nothing unusual. The trapper, however, affirmed that numerous forms could be seen creeping along the edge of the prairie, and that these same forms were more nor less than so many red-skins.

"What are they trying to do?"

"Dunno."

"Hadn't we better withdraw?" inquired Johnny, showing a little nervousness.

"Not till we know they're arter us," was the quiet reply.

By and by the boy himself was able to get an occasional glimpse of the shadowy figures moving to and fro.

"I think they are going to surround us," he added, "and I feel as though we ought to get out while we can do so."

The only reply to this, was by the trapper suddenly bringing his gun to his shoulder and firing. An agonizing screech, as the savage threw himself in the air, showed that the shot had not been in vain.

Rather curiously at the same moment the report of a gun in the ravine reached their ears, followed by the same death-shriek.

"They ain't sleepin' very powerful down thar," was the pleased remark of the trapper, as he leisurely reloaded

his piece, while the boy remained in that nervous state, awaiting the permission of Baldy to go spinning away over the prairie at rate that would very quickly carry him beyond all danger.

But the trapper was in no hurry to give the ardently desired permission. He seemed to have a lingering affection for the place, which prevented his "tearing himself away."

The boy's timidity was not in the least diminished, when several return shots were fired, the bullets pinging all around them.

"My gracious, Baldy, let's get out of this!" he instantly pleaded, starting the man himself.

"Go about fifty feet," was the reply, "but not any further."

It may be said that the steam man fairly leaped over this space, and somewhat further, like a frightened kangaroo, and even then it would not have halted had not the trapper given peremptory orders for it to do so.

The sky was now clear and the moon, riding high and nearly full, illumined the prairie for a considerable distance, and there was no fear but that they could detect the approach of the most treacherous savage, let him come in whatever disguise he chose.

The night wore gradually away, without any particular demonstration upon the part of either the Indians or white men, although dropping shots were occasionally exchanged, without any particular result on either side.

Now and then a red-skin, creeping cautiously along, made his appearance on the edge of the ravine; but there was too much light for him to expose himself to the deadly rifle of the trapper, who took a kind of savage pleasure in sending his leaden messengers after the aborigines.

This species of sport was not without its attendant excitement and danger; for the last creature to take a shot quietly is an American Indian; and they kept popping away at the steam man and its train whenever a good opportunity offered.

Owing to the size and peculiar appearance of the steamer, he was a fair target for his enemies; and, indeed, so uncomfortably close did some of the bullets come, that the boy almost continually kept his head lowered, so as to be protected by the sides of the wagon.

Finally morning came, greatly to the relief of all our friends. As soon as it was fairly light the Irishman and Yankee were notified that a move was about to be made, by means of the steam-whistle.

An answering signal coming back to them, the steam man at once advanced to the very edge of the ravine.

The trapper peering cautiously down the gulch, caught sight of several red-skins crouching near the cave, and, directing young Brainerd to discharge his piece at a certain one, the two fired nearly together. Scarce five seconds had elapsed, when both Ethan and Mickey did the same. All four, or rather three—as the boy gave his principal attention to the engine, began loading and firing as rapidly as possible.

The red-skins returned a few scattering shots; but they were taken at such disadvantage, that they immediately began a precipitate retreat down the ravine.

Ere they had withdrawn a hundred yards, Ethan and Mickey emerged from the cave, shouting and excited, firing at every red-skin they could see, the Irishman occasionally swinging his gun over his head, and daring the savages to a hand-to-hand encounter.

While the two were thus engaged, the trapper was not idle. The steam man maintained his place but a short distance behind the enemies, and his deadly rifle scarcely ever failed of its mark.

The moment an Indian was killed or helplessly wounded, his companions caught and dragged him away, there being a great fear upon the part of all that some of their number might fall into the hands of their enemies, and suffer the ineffaceable disgrace of being scalped.

The savages were followed a long distance, until their number had diminished down to a fraction of what it was originally, and the survivors had all they could do in taking care of their disabled comrades.

Never was victory more complete. The Indians were thoroughly discomfited, and only too glad to get away after being so severely punished. During this singular running fight the steam man kept up a constant shrieking, which doubtless contributed in no slight degree to the rout of the red-skins. They fired continually at the fearful-looking monster, and, finding their shots produced no effect, invested the thing with a portion of the supernatural power which they had given it at first sight.

When the last glimpse of the retreating Indians was seen, the trapper turned triumphantly toward the boy.

"Warn't that purty well done, younker?"

"It was indeed."

"They'll now stay away awhile."

"We would have failed if we had waited any longer."

"Why so, boy?"

"Because the last stick is burned, and the steam man couldn't be made to run a mile further without more fuel."



## ***Spring Making Information***

### **Where to Find Information on Making Springs**

At our May meeting, I promised to let you know what resources I have found for information on how to make springs. Here's what I've been able to find so far:

How to Make Springs by Dave Silberstein is a book that most search engines tend to come up with rather quickly. You can see most of its 138 pages at <http://home.earthlink.net/~bazillion/intro.html> It can be downloaded in full for \$5.95 or you can buy a bound version postpaid for \$16.42. If you want to learn about making springs, this book is an excellent resource. However, like most of the other references I will cite below, it doesn't provide 100% of what you would really like to know before trying to make a spring.

"Design and Wind Your Helical Springs" by Kozo Hiraoka is a 2-part article that was published in the May-June and July-August, 1987 issues of Home Shop Machinist magazine. This article provides helpful information and is worth looking up if you have access to the back issues in question.

Another Home Shop Machinist article titled "Spring Fever-Winding Your Own" by George Ingraham appeared in the May-June, 2003 issue. It contains quite a bit of helpful information also.

Ron Ginger was kind enough to point out to me that Machinery's Handbook provides extensive information on springs, 49 pages worth in the 25<sup>th</sup> edition. Earlier editions also provide extensive information. This is not "how-to" information for the home shop, but it is stuff you want to know about if you plan to make more than one or two springs.

Also, Max ben-Aaron advised that in August/September/October 1986 'Model Engineer' ran a 5-part series on 'Spring Design and Manufacture' which sounds like it would be well worth looking up.

There is also a British book by the renowned model engineering writer, Tubal Cain, titled 'Spring Design and Manufacture'. Given that it has the same title as the ME articles Max found, I'm betting that it's a compilation of those articles or very similar

information. In any case, I haven't seen either the articles or the book yet, but I 'm guessing that Tubal Cain would have included a generous component of home shop how-to information in his writings on the subject. The book is available at <http://www.myhobbystore.com/> for £6.95 plus shipping.

Finally, Ron Ginger also shared his technique for making springs which I think is worth passing on. Per Ron, "One trick I find very useful. You need to guide the wire and keep tension on it. I cut to blocks of wood that fit into my Aloris tool post like a tool bit. I drag the wire through the split between the two blocks. I adjust tension on the wire by tightening the screws that hold the 'tool bit' in place. It works great.

I also have a hand crank for the spindle. I made an inside expansion collet to fit the spindle, with a square shank on it that fits my mill knee handle."

Frank Dorion



### ***To satisfy your curiosity!***

The picture shown above is a display of the major components for a typical "Micro Turbine" jet engine. As you can see, each part is fairly complex, but there aren't that many of them! Below...not a jet engine!





**For Sale**

**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



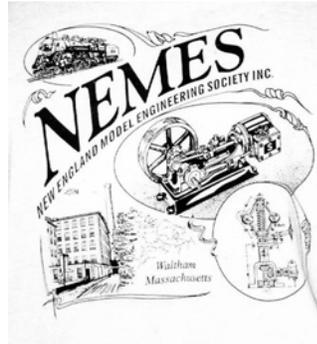
**NEMES clothing**

**NEMES Tee Shirts**

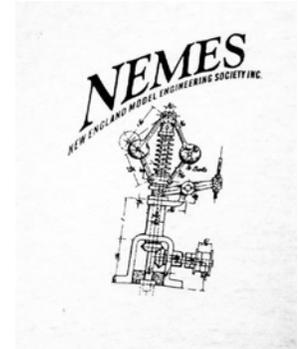
NEMES tee shirts and sweat shirts are available in sizes from S to XXXL. The tee shirts are gray, short sleeve shirt, Hanes 50-50. You won't shrink this shirt! The sweat shirts are the same color, but long sleeve and a crew neck.

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

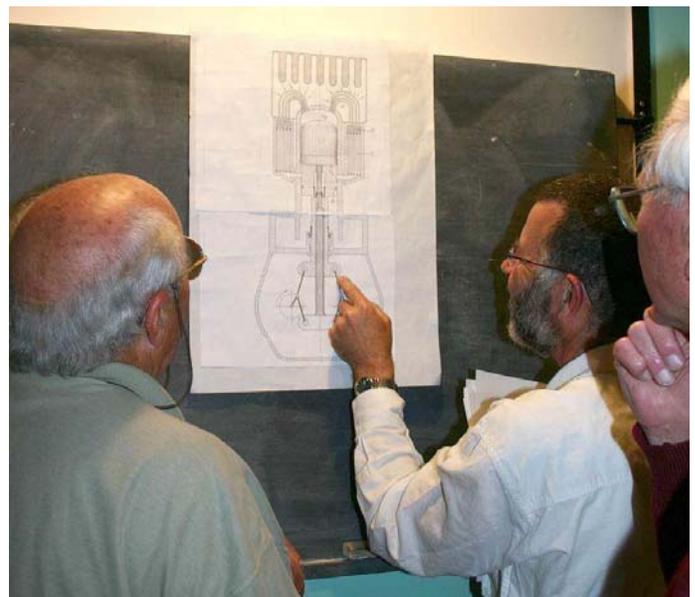
**Prices:**

	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  
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**MARK  
THIS  
DATE**

## **Upcoming Events**

Bill Brackett

To add an event, please send a brief description, time, place and a contact person to call for further information to Bill Brackett at [thebracketts@verizon.net](mailto:thebracketts@verizon.net) or (508) 393-6290.

*Bill*

### Calendar of Events

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.

June 4<sup>th</sup> Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry  
Waltham, MA  
781-893-5410

June 14<sup>th</sup> Custom Vehicles & Antique  
Aeroplane Show  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>

June 19-21st 10:00-3:00 Father's Day Meet  
Pioneer Valley Live Steamers  
Southwick MA.  
<http://www.pioneervalleylivesteamers.org>

June 21<sup>st</sup> 8<sup>th</sup> Annual Van Brocklin Meet  
Waushakum Live Steamers  
Holliston MA  
<http://www.steaminpriest.com/wls>

June 21st 9:00am The Flea at MIT  
Albany Street Garage at the corner of Albany  
and Main Streets in Cambridge

June 21 NEMES display at the  
North Shore Old Car Club  
Topsfield Fair Grounds, Topsfield, MA  
Enter at the main gate  
Ed Rodgers (781) 233-3847

June 27<sup>th</sup> 8AM-4PM Model airplane show  
Plumb Island

June 27-28 Orange Show  
Orange Airport Orange MA

June 28<sup>th</sup> Big Three Car Meet & Antique Aeroplane  
Show  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>

July 2nd Thursday 7PM  
NEMES Monthly club meeting  
Charles River Museum of Industry Waltham, MA  
781-893-5410

July 4th Antique Engine Meet & Tractor Pull  
Boothbay Railway Village  
Rt 27 Boothbay ME  
[www.railwayvillage.org](http://www.railwayvillage.org)

July 4-5<sup>th</sup> Fabulous 50s, Sensational 60s & Antique  
Aeroplane Show  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>

July 12<sup>th</sup> Pepperell Show  
RT 111 Pepperell, MA Ken Spalding 978-433-5540

July 19th 9:00am The Flea at MIT  
Albany Street Garage at the corner of Albany and  
Main Streets in Cambridge

July 18-19<sup>th</sup> Trucks, Tractors, Commercial Vehicles  
Antique Aeroplane Show Owls Head Transportation  
Museum Owls ME  
<http://www.ohtm.org/>

July 24-26 Eliot Antique Tractor & Engine Show  
Raitt Homestead Farm, Rt 103  
Eliot ME. Lisa Raitt 207-748-3303

July 25-26<sup>th</sup> Wings & Wheels Spectacular &  
Aerobatic Airshow  
Owls Head Transportation Museum Owls ME  
<http://www.ohtm.org/>