



# The NEMES

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

# Gazette

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## Gazette Staff

Editor Bob Timmerman

Publisher Jeff Del Papa

## NEMES officers

President Dan Erying

Vice President Victor  
...Kozakevich

Treasurer Richard Baker

Secretary Todd Cahill

Webmaster Jeff del Papa

NEMES web site

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

## Contact Addresses

Dan Eying Presidet  
[deyring2017@outlook.com](mailto:deyring2017@outlook.com)

Richard Baker: Treasurer  
[treasurer@neme-s.org](mailto:treasurer@neme-s.org)

Jeff DelPapa: Publisher  
[Publisher@neme-s.org](mailto:Publisher@neme-s.org)

Bob Timmerman: Editor  
[editor@neme-s.org](mailto:editor@neme-s.org)

Bob Timmerman::Program  
[rtimmerman@gmail.com](mailto:rtimmerman@gmail.com)

## Program

The NEMES program will be held at 7 PM on Thursday, March.1, 2018, in the Jackson Room of the Charles River Museum of Industry and Innovation. The new entrance to the Museum will be open, so you come though that way. Stop and take a look at the improvements.

The meeting agenda will be: A talk by our own Dan Erying about the Boston Associates, the early 19<sup>th</sup> century venture capitalists who founded the Boston Manufacturing Company, which built the mill where we meet; and who went on to develop Lowell, Lawrence, and Chicopee, Massachusetts, and Manchester and Nashua, New Hampshire. Dan will base his talk on research done for the Museum's upcoming exhibit on the Boston Associates

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## Club Business

*Rich Baker*

**Dues.** The 2018 dues are due. Please bring your \$25 check to the February meeting or you can try out our credit card system. Or mail me a check to Rich Baker, NEMES, 288 Middle Street, West Newbury, MA 01985



## President's Corner Dan Erying

Just a few short notes this month. First the NEMES Model Engineering Show last Saturday was well attended by almost 400 visitors, young and old. Many thanks to all who exhibited and equal thanks to all who helped. There was some confusion about whether NEMES members are allowed into the show for free. Well, basically, anybody (NEMES member or not) who exhibits OR helps with setting up or tearing down gets in free. If you just show up to enjoy the show we welcome you but ask you to pay Museum admission.

I don't know how many T-shirts, etc. Rich sold, but between that and the hard work of the Lady's Auxiliary selling all kinds of tasty treats I am told we pretty much broke even on our expenses for the show. And even better than that, Rich says we got 8 new member sign ups during the show! That's great, we need the growth. And if you know ANYONE,

especially young people, you think might be interested, pass along a copy of the Gazette to them and invite them to a meeting.

You may have noticed the Museum upgrades at the front entrance. These will soon include a wheel chair lift. And sometime this Spring, there will be a wheel chair ramp at the Museum's service entrance providing direct access into the Jackson Room where we have our model show. So getting ourselves and our stuff in and out will be considerably easier at next year's show and there after.

You may recall that the club voted at the February meeting to purchase 60 workshop aprons emblazoned with the NEMES logo. After some thought about how long it would take to sell 60 aprons, the club officers decided to donate 30 of the aprons to the Museum – suitably emblazoned with the CRMII logo. We make some kind of donation to the Museum every year to show our gratitude for their support, usually a check. The donation is well appreciated by Director Bob Perry.

And speaking of the Director, the annual Museum fund raising event is scheduled for Thursday, April 5<sup>th</sup>, the same night as our April meeting. It's a great event and a good way to support the Museum, though a bit pricey at \$50 per person. But WAIT! The Director has decided to give any attending NEMES member a 50 percent discount on the ticket price. So you can either go to the NEMES meeting or the W & F Festival. Or both if you are exceptionally energetic!

See you on Thursday!  
Dan



From the  
Editor's Desk  
Bob  
Timmerman

## February Program:

The February program was our traditional poster session, postponed from January due to snow. We had a number of people make presentations, including a new guest, Ian Clark, an engineer and machinist who built his own airplane among other things. He brought a control for a shop heater to efficiently keep his shed shop above the dew point to keep his machine tools from rusting. We all had an interesting time discussing the control, as well as his plane. I am hopeful he will be able to schedule a Thursday night to give a talk to NEMES about the plane project. Dan Erying arranged a ride to the meeting for Mr. Richard Husher, a 96 year old member who was no longer driving.

We do not have any new events on the website. Surely there must be some. Are people not giving the events to us, or are they just not aware the Gazette exists? If anybody knows of other upcoming events, be sure they get on the website.

We still need more articles. We have an article from Max about the Snow engine, and I plan to follow up on my V-belt article with one on flat belts in the near future, but what about all you machinists out there—you must have some interesting projects to write about.

## 1,100 HP twin tandem double-acting Snow gas engine

Max ben-Aaron

[Editor's Note: This article is running the whole width of the page, to better show the picture of the engine. Max is also covering two topics in the article: Steam engines, and large gas engines. The discussion of the arrangement of steam engine cylinders leads to the gas engine discussion.]]

**Steam engines** are [heat engines](#) that perform [mechanical work](#) using [steam](#) as their [working fluid](#). [James Watt](#), Scottish engineer a patented a ten-[horsepower](#) steam engine that produced continuous rotary motion in 1781. Reciprocating piston type steam engines remained the dominant source of power until the early 20th century,

In a single-expansion steam engine, steam enters the cylinder at boiler pressure. The steam pressure drives the [piston](#) down the cylinder, for 25% of the piston's stroke, when the steam supply is cut off. The trapped steam continues to expand, pushing the piston to the end of its stroke, when the exhaust valve opens to expel the partially depleted steam to the atmosphere, or to a condenser. Extra work can be extracted by this "[cut-off](#)" technique, since the expansion of the steam is doing additional work beyond that done by the steam at boiler pressure.

British engineer [Arthur Woolf](#), patented his Woolf high-pressure compound engine in 1805. In the compound engine, high-pressure steam from the boiler expands in a high-pressure (HP) cylinder and then enters one or more subsequent lower-pressure (LP) cylinders. The complete expansion of the steam now occurs across multiple cylinders, with the overall temperature drop within each cylinder reduced considerably.

Double-expansion (usually known as compound) engines expand the steam in two stages. The complete expansion of the steam occurs across multiple cylinders and, as there is less expansion in each cylinder, less heat is lost by the steam in each. This reduces the magnitude of cylinder heating and cooling, making higher expansion ratios practical and increasing the efficiency of the engine.

Two-cylinder compounds can be arranged as:

- Cross-compound – the cylinders are side by side;
- Tandem compound – the cylinders are end to end, driving a common connecting rod;
- Telescopic-compound – the cylinders are one inside the other;
- Angle-compound – the cylinders are arranged in a vee (usually at a 90° angle) and drive a common crank.

One hundred years ago, huge engines like this 1,100 HP twin tandem double-acting Snow dotted the country. With reliability paramount, engines like this Snow were built to last.

**Manufacturer:** Snow Steam Pump Works Buffalo, NY

**Serial no.:** C123

**Horsepower:** 1,100 hp at 95 rpm

**Bore & stroke:** 23 in x 48 in

**Flywheel diameter:** 18 ft

**Ignition:** Originally igniter, converted to spark plugs in 1944 with point tripper system consisting of 16 sets of points, dual spark plugs and dual coils per cylinder.

**Governing:** Ferguson horizontal spring fuel governor



One such engine, built in 1907, this 1,100 HP twin tandem double-acting Snow, was saved from the scrap yard by the [Northwest Michigan Engine and Threshers Club](#) in Buckley, Michigan. It is the only known surviving twin tandem double-acting Snow engine. It weighs an estimated 225 tons, or 450,000 pounds. It worked until around 1944, when it and a sibling were dismantled and sold. Its new owners were only interested in the building housing the engines, and they busted up engine number C124 for scrap, but spared C123 because a grandfather wanted to see it restored. Nothing more was ever done with it. In 2007, its owners, the Elder family, hopeful someone might preserve the Snow, started looking for a club or organization that might restore C123.

The Elders searched through the Farm Collector Show Directory for large clubs that might be able to accommodate the Snow, searching for a suitable home for the Snow, "That's when the engine found me," Tony



Suykerbuyk says. "They wanted to donate it to somebody who would get it running and they contacted our club. We're sitting on about 400 acres that we own and we have our own full-gauge steam train." Tony is a retired farmer, farm manager, machine shop operator and engine builder – and a member of the oil field display committee of the [Northwest Michigan Engine and Threshers Club](#) in Buckley, Michigan.

Tony was immediately drawn to the idea of saving the Snow. Even so, he harbored some doubts as to whether the club would really want to secure it, knowing it would be a monumental effort to disassemble, move and install the Snow. A few months later, Tony and club member Steve Scott went to see the engine. "We went early in the morning. We figured we wouldn't want it and leave early, but it was dark before we left," Tony recalls. The engine, they decided, needed to be rescued. That first visit kicked off the chain of events that led to the engine being disassembled and moved to the club's Buckley Old Engine Show grounds.

Disassembly started in 2008, and by mid-2009, after multiple trips with a lowboy and numerous club members' pickup trucks and trailers, the engine and its components were safely esconsed in to the Buckley show grounds. Using 1907 blueprint for identical engines C95 and C150, club volunteers laid the foundation for the engine beds, a process that involved 10 tons of rebar and 250 yards of concrete to support the two 35-ton, 25-foot long bedplates. With the engine beds in place, a new building, donated by The Wayne Webber Foundation was constructed around the historic engine.

The Snow is a unique reminder of an almost forgotten era in our industrial past. The Club set the goal of having the engine running on compressed air by August 2017, the Club's 50<sup>th</sup> anniversary. After a rescue effort of epic proportions, the goal was met.

Ref. 'Gas Engine Magazine' Vol 53 #1 Dec/Jan 2018 Pp 8--12

## NEMES Annual Engine Show

The annual NEMES engine show was held on February 17, 2018. The Jackson Room of the Museum was almost full of exhibitors, and the Museum staff reported that almost 400 visitors attended. In addition, Rich Baker reported that we got 8 new member sign-ups that day.

## Future Events

There are no future events listed on the NEMES website. If people want to list an event, please contact Jeff Del Papa, our webmaster.