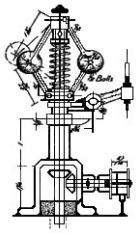


The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 236 December 2015

Gazette Staff

Editor Dan Eyring
Publisher Jeff DelPapa
Events Editor Errol Groff

NEMES officers

President Jeff DelPapa
Vice Pres Victor Kozakevich
Treasurer Richard Baker
Secretary Todd Cahill
Director Steve Cushman

NEMES web site

http://www.neme-s.org

Contact Addresses

Dan Eyring, Editor
editor@neme-s.org

Richard Baker, Treasurer
treasurer@neme-s.org

Jeff DelPapa, Publisher
publisher@neme-s.org

Errol Groff, Event Editor
events@neme-s.org

Errol Groff, Webmaster
webmaster@neme-s.org

Contributors

Kay Fisher
KayPatFisher@gmail.com

Club Business

Richard Baker

Dues. It's that time of year again. We will started collecting the 2016 dues at the November meeting and will continue at the December. Please bring your $25 check or you can try out our credit card system.

NEMES Show

At the November meeting, we decided to hold the Annual NEMES Model Engineering Show at the Charles River Museum of Industry. We traditionally have the show on the third Saturday of February, which is February 20, 2016. It's time to get busy publicizing the show. The CRMII has requested flyers and any other advertising information we may have, Let's discuss how to get this done.

Next Meeting

Thursday, December 3, 2015 7PM

Charles River Museum of Industry & Innovation

154 Moody Street

Waltham, Massachusetts

Directions are Here.

December's speaker will be Thomas Erb of the Electric Time Company, speaking on how they make Street Clocks. These devices are largely made in Massachusetts

Membership Info

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

Deadline for submitting articles is two weeks prior to the next meeting.

Table of Contents

Editor's Desk

Dan Eyring

This month I want to put out a plea to the membership to help out Bob Timmerman in finding speakers for our monthly meetings.

Actually, Bob's job is to coordinate getting in new speakers, based on tips and leads from the members. He's done a great job in the last three months, but he says there are no more program ideas coming in. If we don't start filling up the 'tip bucket', we're going to be having show and tell and bull-chatting sessions instead of the interesting topical presentations we all drive into Waltham to enjoy.

If you know about some company or product or tool or hobby or technology, etc., please contact Bob at:

RWTimmerman@gmail.com

He will do the heavy lifting of taking your tip and contacting the potential speaker, finding out if it's a topic of general interest and scheduling the speaker.

So please, let's all think about what we would like for meeting topics and give Bob a hand making it happen!

Cabin Fever Expo Update

Cabin Fever will be here before we know it! If you are planning on joining us on the bus trip, please:

Make your hotel reservation at the Comfort Inn in Jonestown PA at (717) 865-8080 as soon as possible using the group account number 2318549 and " New England Group" to get the rate of $59 + tax per night (Jan 15 & 16). Remember the cutoff date is Dec 18.

A check for $170 per rider, made out to "NEMES" sent to Richard Baker 288 Middle St. W Newbury MA 01985 is the only way to be included on the official list. Checks will not be cashed until we reach the minimum of 28 participants.

Check out the Cabin Fever website at: cabinfeverexpo.com

Give me a call "Norm Jones at (978) 256-9268" for further info.

Rich has received 14 checks to date!

Shop Talk

Max ben-Aaron

In the summer of this year, 2015, the 75th anniversary of the Battle of Britain was celebrated. I was13 years old at the time, and I vividly remember avidly reading the newspaper every day to see how many of the hated NAZI planes were shot down by the brave 'few'. Every small boy (and not a few adults) fantasized about being a knight in shining white armor, (to mix metaphors) doing battle in the skies mounted on a Spitfire steed.

I did not know at the time how close run the battle was. The Luftwaffe came very very close to defeating the Royal Air Force but they did not know it because they had poor intelligence and little idea of British vulnerabilities.

The stakes were very high: If the Luftwaffe had defeated the RAF it would also have had the air power to destroy the Royal Navy, paving the way for "D-Day in reverse" with a German invasion of the British Isles. A Wehrmacht that got ashore would soon have destroyed a British army that had been forced to abandon its weaponry in France as it escaped from Dunkirk. The RAF was the only bulwark against defeat. The Luftwaffe commenced the attacked in August after wasting most of July waiting for a British surrender that never came. Typical figures show that three engaged RAF groups with 900 fighters were pitted against more than 3000 German bombers and fighters.

On August 8th, Hitler ordered Hermann Göring to destroy the RAF. Operation Adler (Eagle) began on August 13th, with intense assaults on British fighter fields and radar installations. The Luftwaffe made almost 1500 sorties on the 13th, losing 39 aircraft to the RAF's

15. The Luftwaffe soon abandoned air strikes that did substantial damage to radar sites, on August 14–15, turning to attacks on RAF air bases. In the battle of attrition that ensued both sides suffered heavy losses with the RAF losing 295 aircraft against 350 Luftwaffe losses. An average loss of 21 percent of the RAF's fighter pilots and 16 percent of the Luftwaffe's fighter pilots were lost each month during July, August, and September.

For a time the advantage seemed to swing slightly in favor of the Germans, but the combination of British attacks on Berlin and bad intelligence led Hitler to command the Luftwaffe to change its operational approach to massive attacks on London. The first attack on London on September 7 was quite successful; the second, on September 15, failed not only with heavy losses, but also with a collapse of morale among German bomber crews when British fighters appeared in large numbers and shot down many of the Germans.

In fact, early on that very day, when being informed of the RAF's plan to defend against the expected onslaught, Winston Churchill, being briefed about the order of battle for fighter command, asked about the disposition of the reserves, to be told "We have no reserves". As a result of the heavy losses, Hitler permanently postponed a landing on the British Isles and suspended the Battle of Britain.

There are very few instances, historically, of the 'right man at the right time', the indispensable person whose influence on history turned out to be decisive. Britain was fortunate in that it produced two such men when they were needed: Winston Churchill and Hugh Dowding.

Crowning a distinguished career Hugh Caswell Tremenheere Dowding was appointed in 1933 to establish Fighter Command within a new air defence organization. Conventional wisdom at the time was "the bomber will always get through". Dowding conceived of a fusion of multiple technologies: radio telephones, radar, and high performance fighter aircraft into the world's first true air-defence network. He nurtured the Hawker Hurricane and the Supermarine Spitfire into operational status, and above all, lent his weight to the then uncertain potential of radar co-operating with Robert Watson-Watt (a descendent of James Watt, inventor of the steam engine).

Dowding and Watson-Watt made radar (RAdio Detection And Ranging) an essential ingredient in air defence. The original system Chain Home was set on masts 300 feet tall with a transmitter and receiver mast at each site.

The radar was only one element in the system, providing information via telephonic links to plotters in flight control centers. The chief virtue of the system was to avoid 'standing patrols'. Passing through 'filter rooms' plotting the ranges and directions of the attacking aircraft enabled controllers in the operations room to scramble the fighters and vector them to intercept intruders as efficiently as possible. It worked.

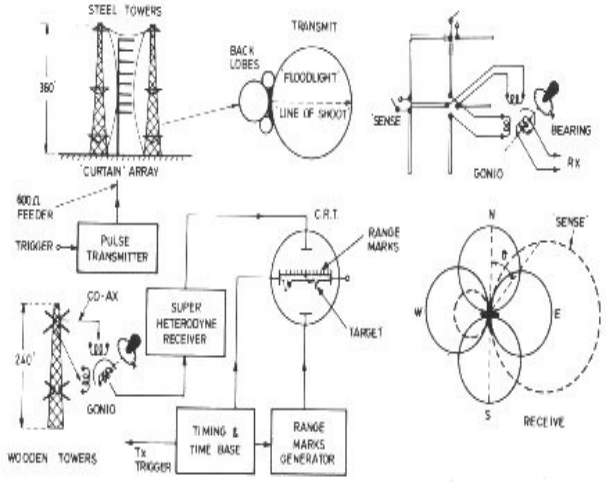
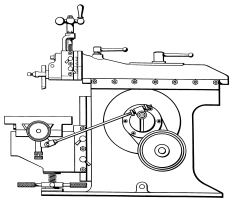


Fig. 1. Principles of CH (Chain Home) R.D.F. system

Dowding's subsequent treatment by the establishment was shabby. In November 1940, a month after the Battle of Britain, he was removed from his command, victim of political rivals within the RAF.

In case you were wondering, this brief foray into history has a purpose; in the next segment, I plan to segue into the story of radar, which was invented following the prediction of radio waves by Maxwell and their confirmation by Hertz.



Metal Shapers

Kay Fisher

R. G. Sparber's Gingery Shaper - Part 68

Shaper Power Train

Some of this design is looking fairly good but there are still a few open issues. Suggestions are welcome!

Power Train Photo by R. G. Sparber

You can see my ¼-HP motor bolted to a ¼" thick plate. The left end of this plate is attached to a heavy duty hinge. To the right of the motor is a jack shaft. In the foreground you see one of the two cone pulleys. I had to clamp on that piece of rusty angle stock to the right of the motor to keep the assembly from bouncing up and down as load on the shaper increased during cutting.

Motor & Jack Shaft Photo by R. G. Sparber

Now you can see the 8" pulley on the other end of the jack shaft.

All screw holes are drilled and tapped ¼-20. The screws holding on the motor and jack shaft bearings thread through the plate and have locking nuts on the back. This arrangement permits the motor support bolts to be a sliding fit on the motor support yet be locked in place. Locking nuts are probably not needed on the jack shaft.

Top Rear View Photo by R. G. Sparber

In order to tension the belt on the left, I tighten the lower right mounting bolt on the motor base. On the far side is a screw set in a block that pushes on the back left corner. The motor can then pivot and tighten the belt.

You may notice that the support block for the hinge is not square with the sides of the stand. The stand legs are not perfectly aligned. I plan to weld a length of ¼" thick by 1" angle in this area. It will be parallel with the top on the stand. A second piece of angle will be bolted on perpendicular to the top support arms. I can then mount the hinge to a true surface. I like using bolts for this second piece of angle because it will permit me to remove it for machining necessary for mounting the hinge.

Motor Side View Photo by R. G. Sparber

You can see a block and screw to the left of the motor. I wasn't thinking clearly about the forces in play so originally had two screws to push on the motor. That could only work if the motor was on a sliding track.

One problem I have now is that the motor assembly bounces up and down when the shaper is under load. A

second concern is that the ¼" plate or slop in the hinge might permit the jack shaft to flex when the fixed part of the hinge is horizontal.

One solution to both of these problems would be to add an adjustable support bar near the jack shaft. I'm certain that others will suggest better solutions.

Another challenge is the belt guards and chip shield over the motor. I'm assuming that when the above design is complete, I will be able to weld on supports and add these parts.

Stay Tuned for part 69 from R. G. Sparber next month.

Keep sending me email with questions and interesting shaper stories.

My email address is: KayPatFisher@gmail.com

Kay

CHARLES RIVER MUSEUM
OF INDUSTRY & INNOVATION

From the Museum

Dan Eyring

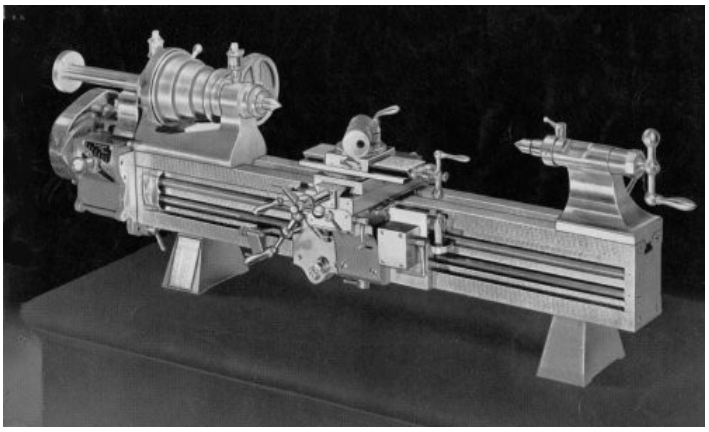
Rivett 608 Precision Back Geared Screw Cutting Lathe

Rivett Lathe and Grinder, Inc. - Brighton, Massachusetts

The lathe on display in this exhibit was manufactured in 1944 by Rivett Lathe and Grinder, Inc. of Brighton, Massachusetts The 608 lathe could be found in laboratory shops in places like Harvard, Johns Hopkins and Yerkes Observatory. They were also present in leading edge industrial laboratory shops and several were sold into the Edison shops in West Orange, NJ. The 608 lathe at CRMII was the first lathe at the Polaroid corporation, and was donated by Mrs. Wolff in memory of her husband Otto E. Wolff, Vice President, Engineering, Polaroid Corporation.

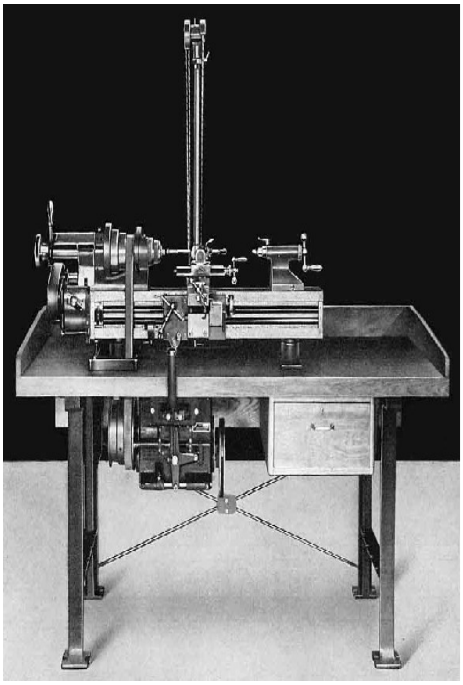
It is interesting to note that Edwin Land (Founder and President of Polaroid) was asked by his 3-year-old daughter sometime in 1944 why she could not see the picture he had just taken of her. Her request led to the introduction of the Polaroid Land Camera in 1948. So it is altogether possible that the specific lathe you see here actually played a role in the development and early manufacture of that ground breaking camera product.

The 608 lathe was the result of adding screwcutting capability to Rivett's 8" plain bench lathe, introduced in the late 1890's. It was also one of the last lathes designed by Edward Rivett. The 608 had the second largest production of any of the larger Rivett lathes, about 1800 total. The basic lathe changed little from its introduction in 1920 until production ceased in 1960.



Approximately 1800 units were produced. Part of the reason for the large production of the 608 was its popularity with the military during World War 2 where it was used on shipboard, in maintenance depots and shipped in large quantities to Great Britain. The 608 is considered by many familiar with them to be one of the finest small lathes ever made.

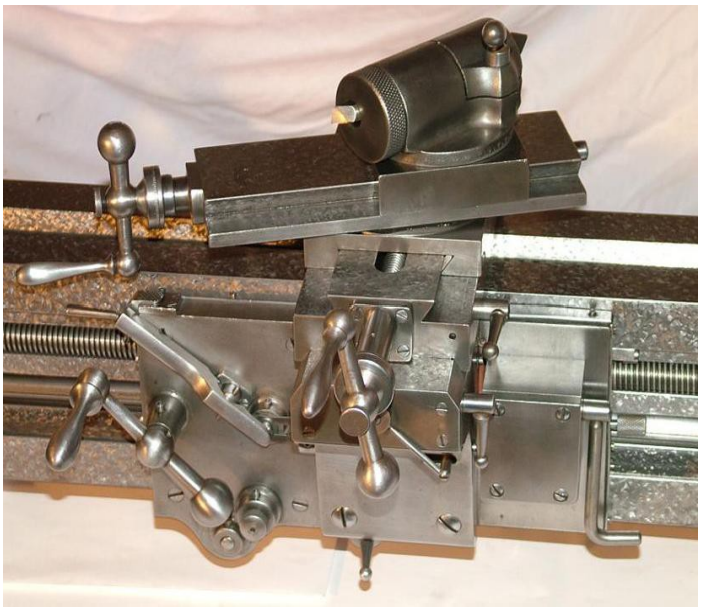
The lathe on exhibit was delivered in one of several available bench mount configurations, incorporating the lathe with a work bench, drive motor, and overhead countershaft, as shown in the catalog image below. However, the Polaroid purchase varied from the catalog configuration in one respect, it has what appears to be a customized motor drive and motor mount, as also shown below:



Origins and Features of the Rivett 608 Precision Bench Lathe

The 608 lathe had it's origins in the "8" Precision Lathe" of the late 1800s. Like it's progenitor, the 608 is an ingeniously designed machine, exceptionally well made and beautifully finished - but, so expensive that most of them found their way into the hands of the military, Government or industrial research and development laboratories.

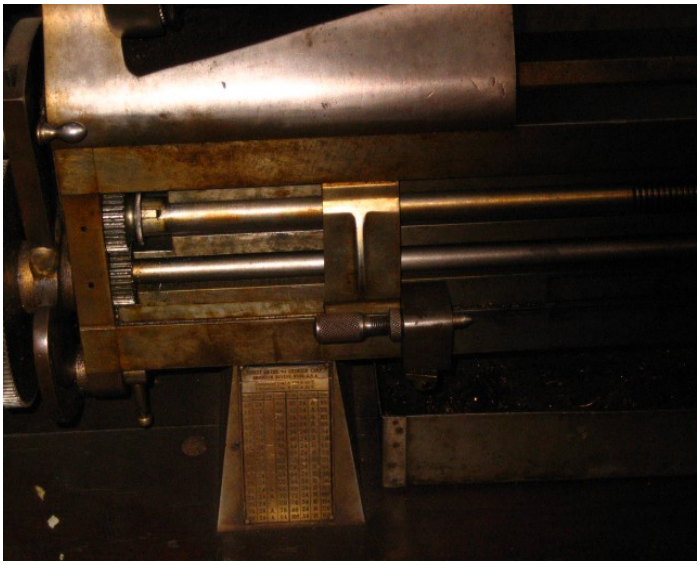
Equally famous in both the USA and the UK (many examples having been sent to Britain during WW2) a 608 in "civilian dress" would normally have glistened all-over in an imposing, fully machined, then hand scraped and polished finish, as shown in the photograph below of the cross-slide and compound-slide assemblies.



While most lathes use only the top face, and upper edges of their beds to guide the saddle (carrying the cross and compound slides), on the Rivett the front face of the bed, formed into dovetails and plain ways, was used to support the apron as well. This resulted in a very stiff structure beneath the cutting tool and a saddle-to-bed bearing area of 74 square inches. The upper and lower dove tails can be seen in the picture below of the front face of the 608.

The picture below also shows the novel arrangement of the 608 leadscrew; it was sunk into the front face of the bed with a good proportion of its rear section fitting very closely against the semi-circular channel in which it ran; this resulted in a well supported, flex-free shaft.

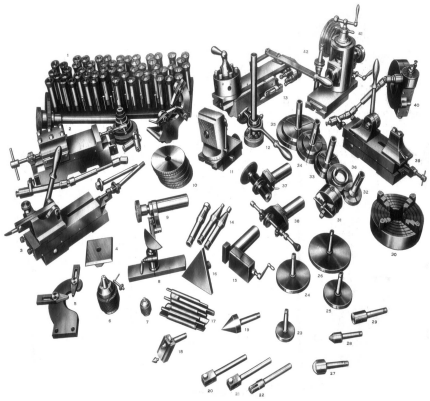
Finally, the picture below further shows that all 608 models were fitted with both a leadscrew and a power-shaft, so preserving the accuracy of the former when simple power sliding and surfacing feeds were required. The drive to the power-shaft was arranged, very simply, by a gear keyed to and sliding on the leadscrew which engaged a fixed gear beneath it on the power shaft; the two gears were covered by a rather elegant nickel-plated bronze cover which slid in groves on the face of the bed. An automatic-disengage mechanism was fitted to the carriage drive and this, with Rivett thoroughness, was fitted with a small micrometer dial and could be set to stop the cut to within 0.001".



And one further note, the picture above shows the actual CRMII 608 lathe prior to being cleaned up. As you can see by looking at the lathe now, under all the grime and dried oil, the fine surface quality of the lathe has survived 75 years hard duty in the Polaroid machine shop.

Typical of the well thought-out features included in the design of the Rivett 608 was the fact that no tools, apart from a chuck key, were required to operate it. A slender lever (it can be seen on the end of the cross-slide base) released the compound slide rest and it could then be instantly re-positioned, or slipped off to be replaced by a

variety of beautifully-made accessories, including a vertical milling slide, hand-tool rest, saw table or indexing, slotting, ball-turning and relieving attachments.



Due to their robust design and construction, many Rivett 608 lathes are in continued use today, nearly a century after the product line introduction. They continue to serve hobbyists and laboratories well, as the lathe on exhibit served Polaroid well for nearly 75 years.

For Further Information - If you would like to learn more about the fundamentals of lathes and the different kinds of lathes, please try out some of the links bellow:

What is a lathe?
https://www.youtube.com/watch?v=gIH6SAXWR5A
http://www.technologystudent.com/equip1/mlathe1.htm

What are the parts of a lathe?
http://www.lathes.co.uk/latheparts/index.html

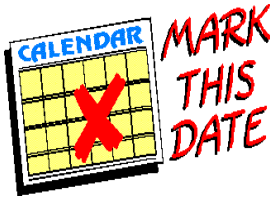
What kinds of lathes are there?
https://en.wikipedia.org/wiki/Lathe

What are the origins of the lathe?
http://homepages.ihug.com.au/~dispater/turning.htm

What is a Bow Lathe?
https://www.youtube.com/watch?v=pDrdTC7qg2s

What is a Spring Pole Lathe?
https://www.youtube.com/watch?v=XEibt31OlCA

What is a Treadle Lathe?
https://www.youtube.com/watch?v=ASwxEfevJTk



Upcoming Events

Errol Groff

Dec 4th Thursday 7PM NEMES Monthly club meeting

Meeting location scheduled to be at the CRMII.

Dec 6 & 7 New England Model Train Expo

Royal Plaza Train Center

181 Boston Post Road West

Marlborough MA

Show Flyer HERE

Dec 12 Annual NEMES Unofficial and Barely Organized Banquet

Woodman's of Essex Restaurant @ **1:00 PM**

121 Main St, Essex, MA 01929

No tickets to buy or reservation to make. Just show up for good company and fellowship

Dec. 13 Straw Hollow Engine Works Frostbite Crank Up

WCD Garage

44 West Main Street
Northborough, MA
(877) 334-1251

For Sale

From Norm Jones:

For Sale: 1/2 HP 6" Carbide Tool Grinder,Import copy of Baldor grinder. Brand New! I have had it for a number of years but never set it up.

It also includes two brand new diamond wheels (fine and medium) and a cast iron pedestal stand.

Current retail value is approximately $500. I'm asking $325.

Call Norm Jones at (978) 256-9268