

The NEMES

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

Gazette

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Presidents Corner

Victor Kozakevich

As the speaker at the April New England Model Engineering Society meeting, author Ron Fierstein will provide us with a unique view of Polaroid, Land, and a number of critical inventions from the mid-twentieth century. The meeting starts at 7 PM on Thursday, April 2, 2015 in the auditorium at the Waltham Public Library. Mr. Fierstein will sign books after his talk (books will be available for purchase). The public is welcome.

Ron's new book, "A Triumph of Genius: Edwin Land, Polaroid, and the Kodak Patent War" takes the reader through the spectacular life of Edwin Land, breakthrough inventor. At the time of his death, he stood third on the list of our most prolific inventors, behind only Thomas Edison and one of Edison's colleagues. Land's most famous achievement, of course, was the creation of a revolutionary film and camera system that could produce a photographic print moments after the picture was taken. The book takes you behind the scenes of his discoveries, his triumphs, and also the defeats of this reclusive genius. You'll learn details of Land's involvement over four decades with top-secret U.S. military intelligence efforts during World War II and through the Cold War in the service of seven American presidents.

As a young attorney, Ron Fierstein worked extensively with Edwin Land during the epic Polaroid vs Kodak patent litigation, learning the detailed

Thursday, Mar 5, 2015

Waltham Library
735 Main 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 Baker) Annual dues are for the calendar year and are due by December 31st of the prior year (or with application).

Missing a Gazette? Send a US mail or email to our publisher. Contact addresses are in the left column.

Issue Contributions Due

MAY	APR 23, 2015
JUN	MAY 21, 2015
JUL	JUN 18, 2015

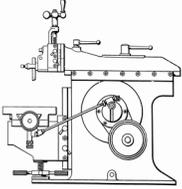
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history of Polaroid directly from Land himself, and studying every aspect of Land's inventions covered by the patents Kodak infringed. Now, several decades later, Ron has written a riveting biography of Land and Polaroid. Join us April 2nd to hear him tell us Edwin Land's story.

I happened to catch some interesting programs on Public Television over the weekend. WGBX- Create had a marathon of the series "Ultimate Restorations", covering several big projects. Among vehicles restored were a Rogers 4-6-0 locomotive, an Ahrens-Fox fire truck (pumper), and a special rail car that once hauled hatchery fish. Have a look at ultimaterestorations.com for more projects.

As I've brought up at a couple meetings, my tenure as NEMES president will come to a close this summer. I hope some enthusiastic member will step up and take the gavel. I think it's worth a few minutes discussion at the next meeting to see if we have an alternate plan should no one step up. I want to believe there is a future for our club and we need a means to sustain it.



Metal Shapers

Kay Fisher

R. G. Sparber's Gingery Shaper - Part 60
Fitting the Table to the Cross Slide (part 1 of 2)

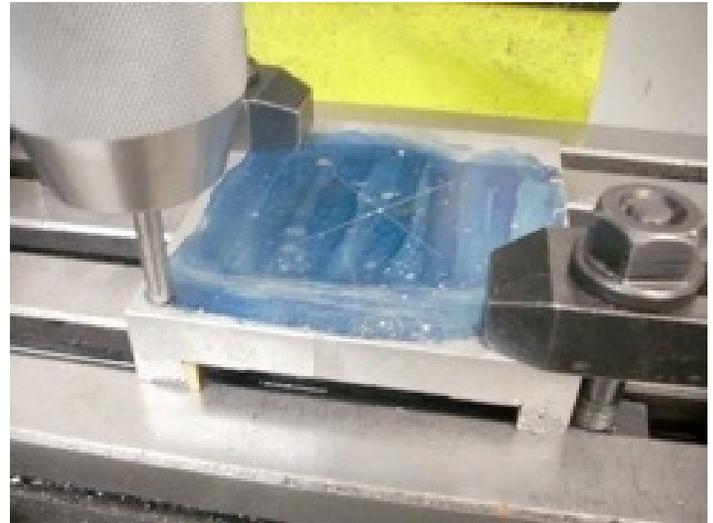
The table is now fitted to the cross slide.



Shaper Front Photo by R. G. Sparber

You can also see a neat trick I learned on line that solves an annoying problem I had with my cast aluminum cranks. Each time I turned one of the cranks, my hands got black. This turned out to be finely ground aluminum. I slipped a short piece of heat shrink tubing over the crank and applied heat. The tubing conformed

to the crank as you can see on the left side of the picture.



Mill Mount of Cross Slide Photo by R. G. Sparber

The cross slide casting was placed down on the table. A dowel in the drill chuck is being used with the DRO to verify it is bedded. I have scribed and marked the center which will next be drilled and bored to accept the pivot pin. I drilled 1/2" and then started to open it to 1" before realizing that my plan had been to only go in 0.2". This is time for a quick redesign.



Cross Slide Flipped Photo by R. G. Sparber

I decided to go with a D ring that would snap into a groove in the pivot pin. The D ring fits snugly into a recess which will keep it closed. This required me to flip the casting over since the recess, which must be concentric with the 1" hole, had to be on the other side.



Pin Installed Back View Photo by R. G. Sparber

Here you see the recess and the pin installed. I haven't presented the pin yet but this arrangement worked well.

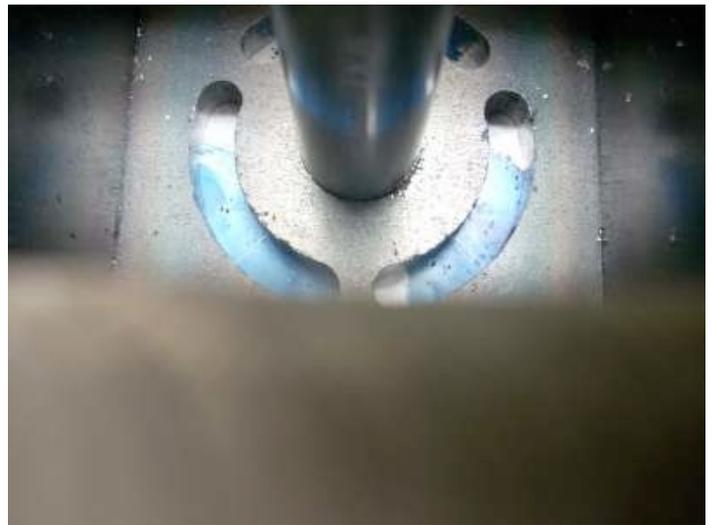


Pin Installed Side View Photo by R. G. Sparber



Without Pin Photo by R. G. Sparber

I removed the pin so the radial locations of the mounting bolts could be scribed.



Inside Box Photo by R. G. Sparber

You might be able to just make out the scribed lines in the photo above. We are looking down into the cube which has been mounted on the pivot pin. The trick is to mark the center line of each arc on the line.



Making Punch Photo by R. G. Sparber

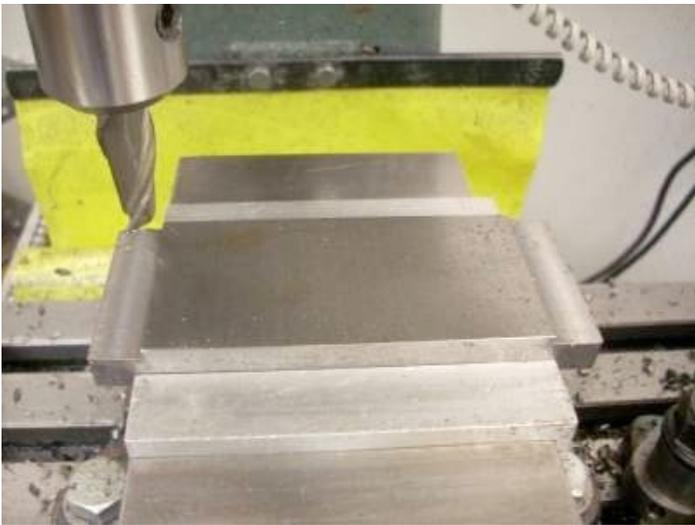
Since I am marking cast aluminum, there is no need for a hardened transfer punch. I just turned one out of CRS that is a close fit to the slot.

The problem I ran into was trying to see the scribe line and hit it with this punch. In the end I didn't get very close to the scribe line and didn't even get close enough to the centerline of the arc. I would have been better off locating the holes with the DRO. That, and using the wider arcs as mentioned in the last article, would have saved me some grief.



Slots After Photo by R. G. Sparber

In the end the bolts all fit but you can see the mess I made of those nice, even slots.



Front Plate Photo by R. G. Sparber

The next step was to make the removable front plate. Steps have been cut in the ends so it can't rotate. A loosely fitting hole was then bored in the center so the pivot pin can pass through.

	<p>Shop Talk</p> <p>Max benAaron</p>	
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If my latest contribution rambled a bit, I apologize. I temporarily "lost the bubble". My grand plan, in talking about electricity was to draw attention to a fundamental watershed in the history of science (and of the world). The continental divide is a geological watershed in the US. If you spit on the continental divide, half will flow into the Atlantic Ocean, and half will flow into the Pacific.

The analogous metaphorical watershed that I have in mind, I believe, marks a definitive division between the old world and the modern world. See if you agree.

The ancients knew about static electricity. The first intimation that there was a different form, 'current electricity' (charges flowing perceptibly) came with the invention of the Leyden Jar, which was a bottle with a layer of foil (not connected) on the inside and on the outside. It acts like a capacitor, with the glass between the foils as the dielectric. Benjamin Franklin used a Leyden jar to prove that lightning was an electric current. He also explained the apparently paradoxical behavior of the Leyden jar as a device for storing large amounts of electrical charge in terms of electricity consisting of both positive and negative charges.

In 1791, Luigi Galvani published his discovery of bioelectricity, when he demonstrated that electricity seemed to be the medium by which nerve cells passed signals to the muscles. Alessandro Volta invented the battery in 1800. (The term 'battery' was invented by Franklin to mean many Leyden Jars connected in series) For the first time, current (DC) electricity could be studied.

Galvani's discovery heralded the birth of electrochemistry by establishing a bridge between chemical reactions and electricity. In his essay "De Viribus Electricitatis in Motu Musculari Commentarius" (Latin for Commentary on the Effect of Electricity on Muscular Motion) in 1791 he proposed a "nerveo-electrical substance" on biological life forms. Galvani concluded that animal tissue contained a heretofore neglected innate, vital, force, which he termed "animal electricity," which activated nerves and muscles spanned by metal probes. He was convinced that this new force was a form of electricity in addition to the "natural" form produced by lightning or by the electric eel and torpedo ray as well as the "artificial" form produced by friction, i.e., static electricity.

Galvani's scientific colleagues generally accepted his views, but Alessandro Volta rejected the idea of an "animal electric fluid," replying that the frog's legs responded to physical differences in metal temper, composition, and bulk. Galvani refuted this by obtaining muscular action with two pieces of the same material.

Volta's battery, or voltaic pile, which he invented in 1800, (what a fortuitous date for a watershed!), made from alternating layers of zinc and copper, separated by an electrolyte, provided scientists with a more reliable source of electrical energy than the electrostatic machines previously used.

Very soon after, in 1800, William Nicholson and Johann Wilhelm Ritter succeeded in decomposing water into hydrogen and oxygen by electrolysis. Then Ritter discovered the process of electroplating, observing that the amount of metal deposited and the amount of

oxygen produced during an electrolytic process depended on the distance between the electrodes. By 1801, Ritter observed thermoelectric currents and anticipated the discovery of thermoelectricity by Thomas Johann Seebeck in 1821, when the Estonian-German physicist demonstrated electrical potential at the junction of two dissimilar metals when there is a heat difference between them.

The pace began to pick up. By the 1810s, William Hyde Wollaston made improvements to the galvanic cell. Sir Humphry Davy, working with electrolysis, concluded that the production of electricity in simple electrolytic cells was the result of chemical action and that chemical combination occurred between substances of opposite charge. His work led directly to the isolation of sodium and potassium from their compounds and of the alkaline earth metals from theirs in 1808.

By 1819 Hans Christian Oersted demonstrated the unity of electric and magnetic phenomena, now known as electromagnetism. This discovery of the fundamental relationship between magnetism and electricity was immediately recognized as an epoch-making advance. Further work on electromagnetism was left to others like André-Marie Ampère, who quickly repeated Oersted's experiments, and formulated them mathematically.

Michael Faraday invented the electric motor in 1821. His discovery of induction formed the foundation of DC electric motor technology, which remained the mainstay until Nikolai Tesla invented polyphase systems.

In 1827, the German scientist Georg Ohm expressed his law in this famous book "Die galvanische Kette, mathematisch bearbeitet" (The Galvanic Circuit Investigated Mathematically) in which he announced his famous law ($E/I = R$) and gave his complete theory of electricity.

In 1832, Michael Faraday's further experiments led him to state his two laws of electrochemistry. In 1836, John Daniell invented a primary cell which solved the problem of polarization by eliminating hydrogen gas generation at the positive electrode. Later results revealed that alloying the amalgamated zinc with mercury would produce a higher voltage.

Electricity and magnetism (and light) were definitively linked by James Clerk Maxwell, in particular in his mathematization of Faraday's seminal idea of a 'field', in his ground-breaking work "On Physical Lines of Force" in 1861 and 1862.

This rapid progress was made in electrical science in the early 19th century. The late 19th century would see even greater progress in electrical engineering. The genius of Ferraris, Oliver Heaviside, Lord Kelvin, Sir Charles Parsons, Ernst Werner von Siemens, Joseph Swan, Nikolai Tesla, Thomas Edison and George Westinghouse, transformed electricity from a scientific curiosity into an essential tool for modern life, becoming

a major driving force of the Second Industrial Revolution.

Add Samuel Morse's and Alexander Graham Bell's exploitation of Stephen Gray's discovery of the almost instantaneous transmission of information through a conductor, and the contours of the modern world begin to take shape. Guglielmo Marconi turned Hertz's experiments in the propagation of electrical signals through space, into practical wireless telegraphy. These two streams coalesced in the technology of the now-ubiquitous cell-phone.

So, I conclude that our modern age began, really when Volta invented the battery.

	For Sale Harvey Noel	
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Rhodes Shaper like the one at the Waltham museum where we used to hold our meetings. Only better it has an electric motor and the table can be adjusted. I need to skinny down as we are planning on moving this summer.

It is in my basement only has six stairs out and it breaks down easily.

More Information call me Harvey Noel at 603 767 0873. Open to any offer over scrap value.



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:

events@neme-s.org or 207-865-1347

April 2nd Thursday 7PM
NEMES Monthly club meeting
Subject and place to be determined
See NEME-S.ORG for details.

April 10-12th
Cabin Fever Expo Bus trip
Dick Boucher 978-352-6724
www.cabinfeverexpo.com/

April 18-19th NAMES Expo
Yack Arena Wyandotte,MI
namesexposition.com/expo.htm

April 18-19th Woods Hole Model Boat Show
Woods Hole Ma
www.woodsholemuseum.org/
(508) 548-7270

April 26th Belltown Antique Car Club
Gas and Steam Show
East Hampton Ct
www.belltownantiquecarclub.org/shows/engine%20show%20main.htm

May 2nd Connecticut Antique Machinery Museum
Spring Power Up
Kent Ct. John Pawlowski President P.O. Box 1467
New Milford, CT 06776
ctamachinery.com/SpringPowerUP2012.html

May 3rd NHPOTP engine show
RT 113 Dunstable MA
Robt Wilkie 207-748-1092

May 7th Thursday 7PM
NEMES Monthly club meeting
Subject and place to be determined
See NEME-S.ORG for details.

May 17th Spring Steam-up
Waushakum Live Steamers
Holliston MA
www.waushakumlivesteamers.org/

May 12-14th 9:00-5:00
EASTEC at Eastern States Expo
West Springfield MA
www.sme.org/eastec