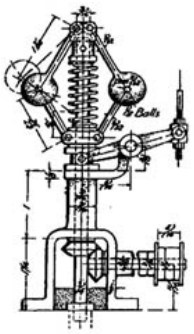
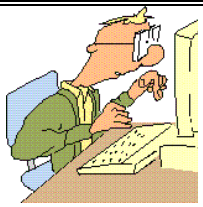


The NEMES Gazette

NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

No. 172 Aug. 2010



Editor's Desk

Frank Hills

A Short History Of Plastics

Plastic, everyone knows what it is when they see it, but few know much about it. Based on natural or man made resins, plastic is simply a long chain hydrocarbon moleculed material which links and twists and tangles itself up making a continuous, non-cellular, non-crystalline, strongly bonded material. Early plastics were based on natural substances. One of the first, Parkesine (named after its creator Alexander Parkes), was derived from the cellulose in cotton or wood. Parkes discovered that when cellulose was reacted with nitric acid, and then the resulting (and flammable) nitrocellulose was dissolved in alcohol a hard, heat moldable material was created. He quickly found uses for it. It wasn't terribly strong, but it made nice hair brushes, back scratchers and the like.

Leave it to the creative, though, to try to better someone else's idea. Later in the 1800s, John Wesley Hyatt discovered that adding Camphor to the mix made Parkesine harder and stronger. In large cross-section parts its hardness shined.

–Continued on page 2

Next Meeting

Thursday, Aug. 5, 2010

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 31st 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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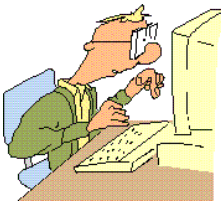


Editor's Desk

-continued from page 1

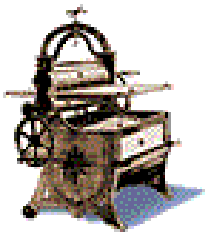
He made billiard balls out of it. Seems the ivory that was being used was a bit expensive. In thin cross section is was very flexible. This property made it perfect for a new and budding technology, movie film. Soon other uses and other processes followed.

One of the beauties of plastics is that they can be engineered to suit the need. Change their properties; change the uses it can fulfill. Different natural resins produced different properties. Milk protein mixed with formaldehyde was the beginning of casein plastics used for making synthetic horn and semi-precious stone. Phenol-formaldehyde resins were used as an ebonite substitute for making electrical insulators…bakelite. But many of these common plastics have fallen into disuse. Oil-based resins could be obtained in far greater quantity and far cheaper. Today most plastics come from this base.

Making the switch to man-made resins wasn't easy though. Early experimenters in the field had trouble making the long hydrocarbon chains. Nature knew how, man had to learn the hard way. As it turns out, when you make these long molecule chains you frequently end up with water as a byproduct, and the water kept breaking into the chains by adding a tail or some other disruption to the building molecule. It took a while for the chemists of the time to figure out what was wrong and separate the water from the reaction. When they final did, they discovered the key to making rayon, nylon, and a long list of other plastics.

Now if we could just get those plastic grocery bags to break down rather than hang on tree branches! They're working on that, too.

Next month "The Sound Barrier…Older than You Think!"



NEMES Gazette Editorial Schedule

Issue	closing date for contributions
Sept. '10	August 20, 2010
Oct. '10	September 24, 2010
Nov. '10	October 22, 2010
Dec. '10	November 19, 2010

Past President's Corner

Dick Boucher

ATTENTION!!

Please do not under any circumstances cross the yellow barricade tape and enter into the main floor of the museum. There is a serious structural weakness that has developed in the roof over that area and the area is closed. We can still enter the building through the door on the river side and access the Jackson Room going up the ramp.

The Meeting

This month I am happy to announce that our own Rolly Evans will be telling us about his latest project, a reproduction of a 1906 Model EX Stanley Steamer. This is a magnificent piece of craftsmanship and I am glad Rolly will be sharing the story of its construction with us.

Some one has suggested that possibly we could have a sort of flea market at the last meeting for the benefit of the museum. Well that didn't happen but I still think it would be a good idea so we should probably talk about it at the meeting. It would be a good time to clear some of our excess out of our shops and, of course, add to our excess from the other fellow's shop.

There has been a rumor floating around that the museum was closing. Let me assure you that it is not true. Admittedly there are some significant hurdles to be jumped before things can be put back in order and the museum can reopen its doors to the public, but Elln and her staff are diligently searching all the avenues to get funding to make the necessary repairs to the building and get the final restoration work done on the artifacts that were in the water. There are still “a lot of ifs” as Elln has put it, but closing the museum is not in the cards.

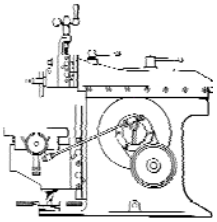
Let me repeat that I hope many of you can find the time to write a check to the Flood Relief Fund, Charles River Museum of Industry and Innovation, 154 Moody Street, Waltham, MA. We have had a great relationship with the museum since our first meeting in the amphitheater 15 years ago

Miscellaneous Ramblings

Bea and I have attended three Live Steam meets since I last wrote. Despite the heat of the last month, the days of the meets were quite nice even if the one in Ossippee NH was a bit on the drizzly side, but it didn’t dampen the enthusiasm of the gathered devotees. The Billy VanBrocklin met at Waushakum was also well attended. We met with our sons and their families there for a relaxing day enjoying watching the grandchildren enjoying the meet and riding on the trains. One more great day was spent on Cape Ann overlooking Ipswitch Bay again enjoying the hobby creations of the small train enthusiasts.

The one thing that has taken a back seat has been the repair of my MGB roadster. It has been just too darn hot to be crawling under the little car trying to get the new engine and transmission hooked up. I am looking forward to the heat breaking and cooler weather coming back so I can get the car running.

Dick B.



Metal Shapers

By Kay Fisher

R. G. Sparber’s Gingery Shaper - Part 5

Machining the Ram Casting

Overview

I have read more about how to machine the ram casting than any other part. Gingery suggests using a steel core to make the pivot support. Given that I have a lathe and mill, this seems like more trouble than it is worth. Others have suggested ways to fix errors in this pivot support due to casting distortion. My plan is to just leave it out. Using suggestions from many good sources, I plan to machine the bottom, then the sides. These will be my first two reference surfaces. I will then machine the cap. It will be bolted to the body of the ram with two 0.005” shims. The center of the bore will be the line between these shims and half way between the machined sides. If this is not clear, refer to the following pictures. I plan to mount the ram with fitted cap on my lathe's compound, fly cut the front and then drill and bore. In this way, the front of the casting is my third reference plane and the bore is perpendicular to it. When that is done, I will mount the steel plate.

Rough Clean Up Photo by R. G. Sparber

The bottom and what I call the “non-crank” side of the ram are fairly clean. You can see a bit of the runner near the left side of the vise jaw. I filed off some of the flash.

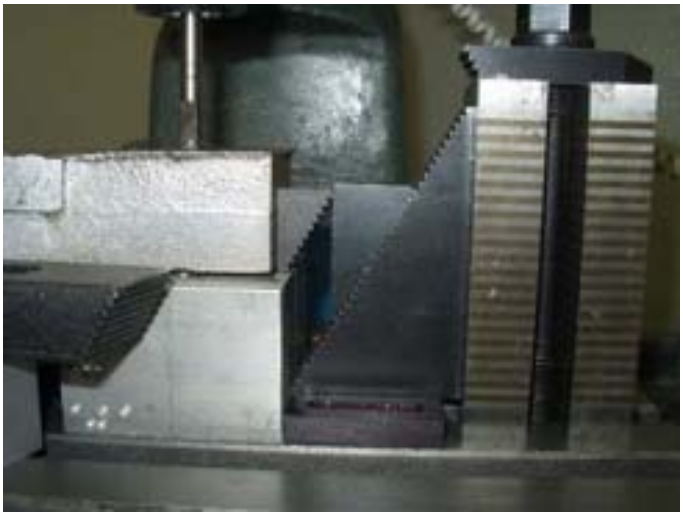
Ram on Mill Photo by R. G. Sparber

I learned a lot about casting from doing (almost ruining?) the column side plates and front plate. This time I am using ball bearing support blocks on the front of the casting (right side of table) and a jack for the third point to support the back of the casting (left side of the table). I have also arranged the hold down clamp hardware so the entire bottom of the casting (the top face) is exposed.

Movement of the casting along the X axis is prevented by a toe clamp on the left and a floating block on the right. Y axis motion is prevented by blocks pressing against the vertical section of the casting. Z axis motion is prevented by my 3 point support and the downward force of the toe clamp and floating block.

I used a level to get the casting reasonable level along the X and Y axes.

Here is a close up of the floating block. The force from the toe clamp at the other end of the casting will push against this triangular block. Since the block is only supported at the top, it will tend to rotate counter clockwise. That will cause the top edge of the block to dig into the casting and push down. It worked so I guess there must be something to my reasoning. In hindsight I can see that it would have been better to leave a gap at the bottom of this floating block so the aluminum blocks don't prevent rotation.



Right Hold Down Photo by R. G. Sparber

In the photo below, you can barely see one of the ball bearings embedded into the aluminum block.

Left Hold Down Photo by R. G. Sparber

Over at the left end of the casting, I have my third support point. It is a jack which enables me to easily level the casting. In the photo above, you can see the triangle-shaped toe clamp. When first placed against the casting, this toe clamp was at a 45^{o} angle. Once tightened by pressure from a hold down clamp, the triangle block is almost horizontal. That is not good so I had to adjust it back to its original orientation.

Back Hold DownPhoto by R. G. Sparber

Above is the view from the column side of the mill, after adding a bit of packing. You can see the toe clamp now closer to the correct angle.

If I used this arrangement at both ends of the casting, it would have been difficult to balance the forces. It is better to just push on one end and then use that force to lock down the casting at the other end.

Front Hold Down Photo by R. G. Sparber

Y axis support is with a pair of cast iron V blocks. I first used the C-clamp to lightly push the blocks into the casting and then lightly tightened down the hold down clamps. The C-clamp was then firmly tightened followed by firmly tightening the hold down clamps. If the C-clamp was fully tightened first, it would prevent the blocks from seating onto the table. Similarly, clamping the blocks to the table first would have prevented them from pressing fully onto the casting.

One last check – walk through the effects of forces along all 3 axes to be sure that nothing can move. Then I ran the cutter above the surface to verify that there was no problem with interferences or with lack of movement of the table. It is close on the left side so I will advance the table that last ¼" by hand.

Start of Milling Photo by R. G. Sparber

I used a shell mill with brazed carbide cutters. It runs at the mill's maximum speed of 2500 RPM. I am feeding the table at about 1 inch per minute. Each pass was 0.025" except the last one which was 0.005". I only used cutting fluid on the last pass. I'm not sure it mattered.

You can see a casting problem in the above picture. My first pass removed 0.025" from the highest point. The area missed is from shrinkage during the cooling of the aluminum. Heavy gates were placed on both sides of this area and they lead to 1" diameter risers. Probably the gates froze before this heavy section froze. This caused the available aluminum in the gates and risers to not flow into the body of the casting. Maybe pouring at a higher temperature would have helped. Another trick I've read about is to cover the risers with sawdust which will act as an insulator. The shrinkage did not spoil the casting but there certainly is a lesson here.

After Two Cuts Photo by R. G. Sparber

On the second 0.025" deep cut you can still see signs of shrinkage in photo above.

After Three Cuts Photo by R. G. Sparber

My third 0.025" cut looks good but you can still see signs of shrinkage. If you look closely, you can also see that the head of my mill tilts slightly to the left. This causes the left side of the shell mill to cut a little more than the right side. The result is that the left end of the casting has a uniform cut, but the right side, inside the black circle, there is a change in surface finish where the cutter stopped. I could not go further without hitting some hold down hardware. Actually, on the finish cut, I did just kiss the right large triangle block but managed to survive with minimal damage. It is hard to see cutters when they are working. The finish cut removed the rest of this shrink void and the surface is ready to accept the steel plate. That work is for another day. Now, it is time to cut my next reference surface. Note that I cut the largest reference surface, #2, first. I figure this will give me the best change of accurately positioning the casting for the next set of cuts.

The above work took 2½ hours. Most of that time was invested in the set up.

Left Hold Down Photo by R. G. Sparber

I have carefully cleaned the table and placed a 123 block on its side. A hold down clamp is tightened over it. The casting is then C-clamped to this block so my newly machined reference plane is flat on the block. I used a level to get the exposed top surface approximately parallel with the table.

Right Hold Down Photo by R. G. Sparber

I then put down my second 123 block and lightly clamped it to the casting. A hold down clamp was lightly applied. Then the C-clamp and hold down clamp were tightened. In this way there should be no stress on the casting. The casting is ready to have reference surface 1 machined.

I would like to extend a special thanks to Brian Lamb. His generous guidance made the day's work successful.

Stay Tuned for part 6 from R. G. Sparber next month. Keep sending me email with questions and interesting shaper stories.

My email address is:

KayPatFisher@gmail.com

Kay

NEMES Shop Apron

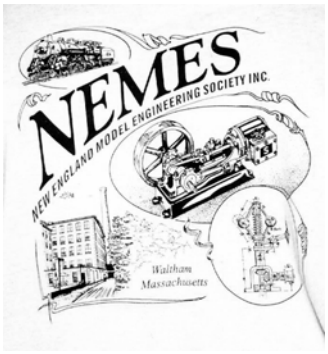
Look your best in the shop! The NEMES shop apron keeps clothes clean while holding essential measuring tools in the front pockets. The custom strap design keeps weight off your neck and easily ties at the side. The apron is washable blue denim with an embroidered NEMES logo on top pocket.

Contact Rollie Gaucher 508-885-2277

NEMES 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

For Sale

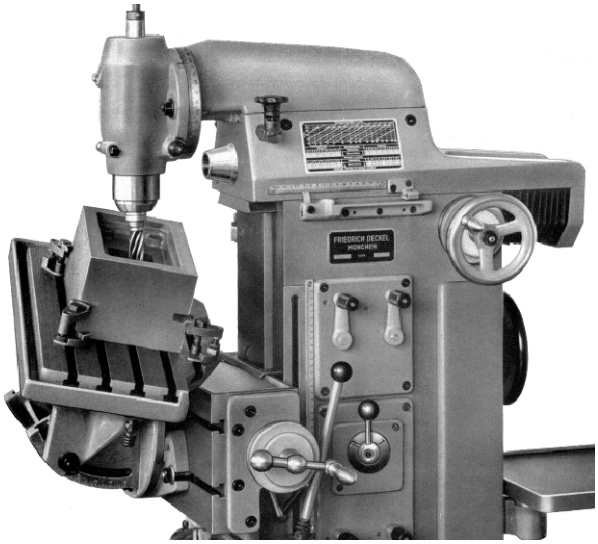
Deckel FP-1 Universal Mill

I am a retired machine design mechanical engineer, and have originally been using a Bridgeport like (knee type) milling machine as well as a Myford lathe to make prototypes.

This story began more than 10 years ago when I was looking for a rotary table. I found one and bought it from a German gentleman living in North Carolina. This gentleman had just retired, and offered his Deckel FP-1 milling machine as well, which he had purchased brand new and only used himself in his home shop. I was fascinated by the machine and I decided to buy it. This is a most fantastic machine, with incredible possibilities if one was lucky enough to acquire the attachments for it (unfortunately not manufactured any longer). My FP-1 is fitted with the universal table attachment, which rotates around the 3 axes. A few years later I purchased the spiral milling attachment, which is brand new. Unfortunately I never had a need to use it.

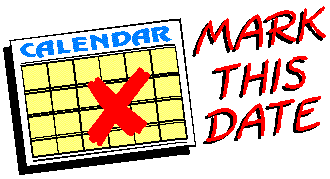
This machine allowed me to machine just about anything, which is as important in my career as it is to a model engineer. Unfortunately I never considered it important to take pictures of what I machined on my FP-1, but I can say that it has always been a pleasure to work with, primarily because of its incredible capabilities, and also because of its sturdiness, which is the key for making precision parts. It is nothing but a dream machine, all model engineers should know about, and would love to have one like it.

Asking US $12,500 FOB Montreal Canada.
(Please see photos on the following page.)
Michel Letendre
304-7090 Cousineau Blvd
St-Hubert Qc Canada
450-676-6527
rdmichelletendre@videotron.ca



Catalog photo of a Deckel FP-1 in use, showing the unique capabilities of a universal mill

Actual Photo of Michel's Deckel FP-1



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 or (508) 393-6290.

Aug 5th Thursday 7PM
NEMES Monthly club meeting
Charles River Museum of Industry
Waltham, MA 781-893-5410

Aug 7th-8th Scribner's Mill Show
Sebago Lake Region near Harrison ME
207-583-6455

Aug 14th-15th Straw Hollow Engine Show
Boylston, MA
J. A. Resseguie 508-869-2089

Aug 15th 9AM The Flea at MIT
Albany Street Garage at the corner of Albany and Main Streets in Cambridge
http://www.mitflea.com/

Aug 21st - 33rd Annual New England Auto Auction
Owls Head Transportation Museum Owls ME

Aug 27th – 29th The 40th Annual Meet
Waushakum Live Steamers, Holliston MA
http://www.waushakumlivesteamers.org/?page_id=8

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

Sept 4th & 5th
Vermont Gas & Seam Engine Assoc show
Intersection Rte 100 and 107, Stockbridge VT
Gail Norman 802-485-8224
gailnorman@trans-video.net

Sept 4th & 5th Vintage Motorcycle Meet & Antique Aeroplane Show
Owls Head Transportation Museum Owls ME
http://www.ohtm.org/

Sept 11th -12th Dublin Show
RT 101, Dublin, NH 603-863-4696

Sept 10th-19th Annual Lee's Mills Steamboat meet
Lake Winnipesaukee Lees Mills NH
http://www.steamboating.org/