The Bay Area Engine Modelers Club, Branch 57 of EDGE&TA

MEMBERSHIP
$25.00 US
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The Crank Calls

March 2009

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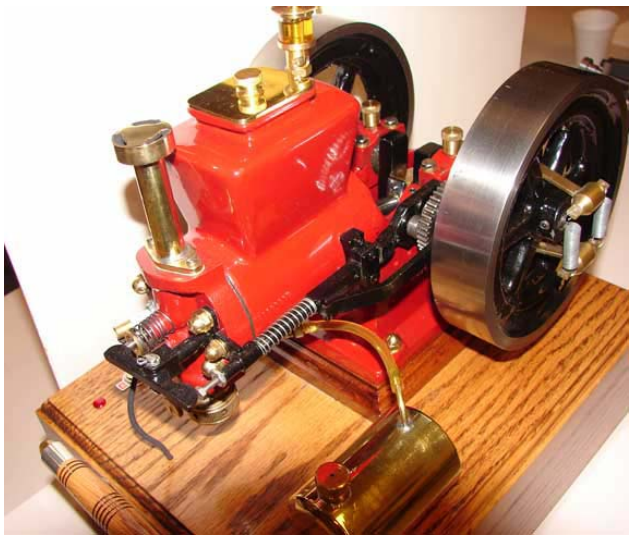
NEXT MEETING
March 21, 2009 at
Chabot College, building 1400
25555 Hesperian Blvd, Hayward 94545
Doors open at 9 AM
Meeting Starts at 10 AM

Upcoming Events
April 17-19 N.A.M.E.S. in Ohio
April 18, 19 Calif Antique Farm Eqpt
May 30, 31 /www.sturgeonsmill.com/
June 28 Palo Alto Concours
July 18-19 WEME in Vallejo

MEETING NOTES

2-21-09 Carl Wilson

Five guests signed our register for the February meeting: Marcus Sysom, a student in Mike Absher's machining class; Bijan and Navid, neighbors of Bill Peterson; Dave Byersen saw our website and at Good Guys; and John Corsby, a student at Chabot College.

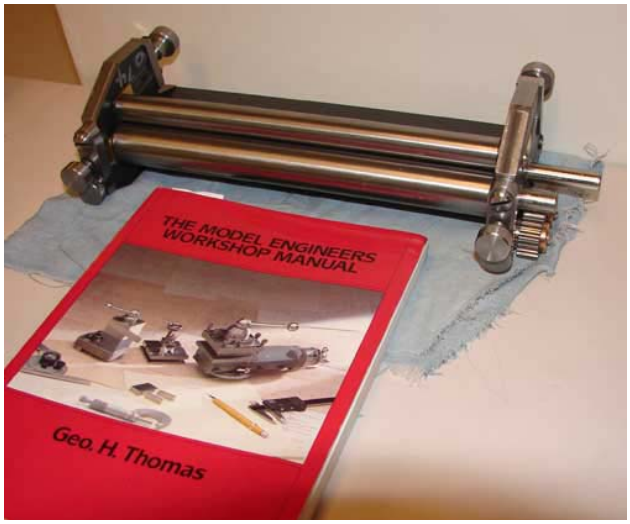


First Pop honors, actually "Re-pop Honors" go to Dwight Giles and George Gravatt who brought "The Young Engine" back to life. George replaced the aluminum piston with cast iron and two piston rings; built a new ignition system; new gas tank, and made the display box. Dwight did the paint job. George started the engine with a mere twist of the wrist and declared it ready to sell. The Board of Directors has approved the sale: terms and a bid form are on the last page. Thank you, Dwight and George for your work.

Secretary's Report: The Board of Directors of Bay Area Engine Modelers met before the club meeting and elected Bob Kradjian as Chairman of the Board. Congratulations Bob. We then adopted the Bylaws governing the operation of the club, and established the procedure we will follow for selling club property. Following the director's meeting, we also had a WEME show managers meeting. Only two items will be reported here: we decided to leave the admission at $7 for individuals, and $10 for families. And the show this year will be dedicated to the memory of Al Vassallo and John Vlavianos.

Treasurer's Report: Ken Hurst reported that we have about $3600 in our checking account and $1800 in savings. We have 47 dues paying members out of 149 names on our list: that is only one-third! Please pay your dues! Four dollars goes to membership in Early Days Gas Engine and Tractor Association, and $4 covers our insurance. The rest is used for the operation of the club, principally the cost of printing and mailing the newsletter. The club bought a new printer for the newsletter as authorized by the club at the January meeting.

Dwight Giles built this 1/24th scale model of a threshing machine designed about 1792 by William Adams in England. The original model, made in England and now missing, was commissioned by Thomas Jefferson in 1792 and received at Monticello in 1793. John Buck, an American millwright, built the full size thresher in 1796 and it was used in that year's harvest. The Thomas Jefferson Foundation contacted Mike Rehmus about having a replacement model built. Mike recommended Tom Hare for research and design, and Dwight for construction. Photo by Mike Rehmus



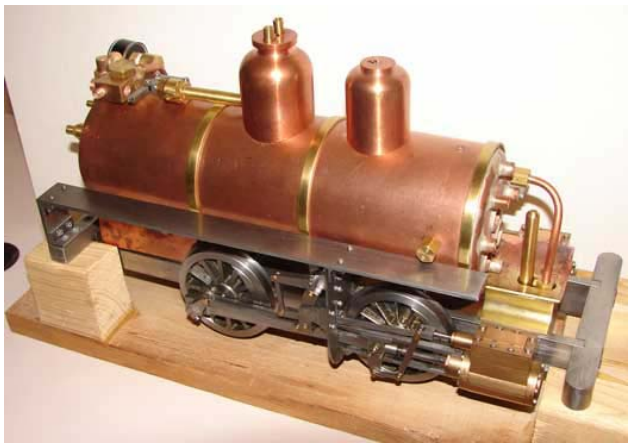
Len Higgins is building a sheet metal roller to the design by George Thomas, published in Model Engineer in Oct. 1976. This design is also available in GHT's Model Engineers Workshop Manual and on the web at http://www.metalwebnews.com/howto/rolls/BendingRolls.pdf. The rolls are 10" long; in the article GHT writes of bending 18ga steel 1.5" wide to a 3" diameter circle. He did not indicate the capacity at full width.

Don Jones teaches machine shop classes at Chabot College, our meeting place. The shop recently installed a programmable Blanchard grinder which makes the production of these parallels by the students much easier. These are roughed out on a mill, casehardened, rough ground on the Blanchard, and finished on a reciprocating surface grinder to +/- 0.0001". A Blanchard grinder uses a large diameter segmented wheel mounted on a vertical spindle. The workpieces are mounted on a rotary magnetic chuck beneath the spindle. Large amounts of material can be efficiently removed which allows more material to be left on the parallels to compensate for any distortion during heat treatment.

Jim Piazza is making progress on the rotors for a Roots supercharger. Underneath one pair of the rotors mounted on the aluminum bar is a pair of gears which allows Jim to test the mesh of the rotors while geared together. At the bottom of the picture is a stack of five of the rotor pieces mounted on their shaft. Jim said that his original plan to align the pieces with

dowels in the three holes in the pieces did not work so he built the alignment fixture shown at the top left. Note that the lobes look like involute gears rather than the more common round lobes in a GMC -71 series Roots blower.

Dwight Giles showed the water pump from the Black Widow V-8 engine. The plastic bag contains the small parts: a bearing, shaft seal, snap ring, and fasteners. To the right is the curved impeller on the suction side disc with o-ring seal. The brass discharge and shaft housing is at the far right; at the top left is the mounting plate and to its right is the complete assembly.



Peter Lawrence has a wide range of model engineering interests and projects. Here is his build of a live steam locomotive in 2.75" gage (NMRA "F" scale); originally designed by Kozo Hiraoka in 3.5" gage. The title of the book is also the name of the prototype: The Pennsylvania A3 Switcher. It is available from The Village Press – ISBN 0-521-81517-7. Peter provided some additional details on the construction of the steam and sand domes (the two vertical cylinders on top of the boiler – a piece of 3" copper pipe.) They are lengths of standard copper plumbing pipe that have been hammered (rawhide hammer) down over a former and a machined copper cap silver soldered on. Peter said that he learned that even with repeated annealing he could not form the copper to a closed dome. The engine ran smoothly on compressed air.

Peter also showed some of the parts for the Merlin V-12 engine. From top to bottom: connecting rods, camshaft blank, and valves. The valves begin as 5/16" diameter titanium bar stock. The stems are machined to 3/32" diameter by 7/8" long with repeated cuts to diameter by a carbide parting tool. They are not turned longitudinally.

TECH TOPICS

George Hawks presented the Tech Topic: operating three phase motors on single phase power. He talked about the two systems that would be easiest for the home shop machinist to install in his shop or even to build: the static and rotary phase converters.

Three phase motors are common on industrial machinery because they are relatively inexpensive, more efficient, more reliable, and have less vibration. A lot of older industrial machine tools with three phase motors are available to the HSM at attractive prices and will give excellent service in the home shop. But something has to be done about those three phase motors.

The problem lies in the way that the motors are constructed and connected the source of

electrical power. Single phase motors connect via 2 wires while three phase motors require 3 wires. If a 3ph motor is connected to a single phase supply with two wires, it will fail to start, get hot, and then burn up. But if a 3ph motor is started by some means it will continue to run on 1ph power. The only difference is that it will not deliver full rated horsepower; it will now be de-rated to 50 - 66%. It is possible to wrap a rope around the shaft of a 3ph motor, give a good pull and turn power on to the motor. It will run. That's a little inconvenient so there are automatic starting and running systems available.

Phase Converters come in two forms, static and rotary. They are similar in that both use some device to connect a capacitor to the third leg of the motor, i.e. the one not connected to the single phase power. The capacitor supplies the third leg needed to start the motor. Once the motor is up to about 80-85% of full speed the starting capacitor is disconnected. The static phase converter, typically a small box connected between the motor on-off switch, is the cheapest "phase converter." It is not really a phase converter, rather a starting switch that gets the 3ph motor running and then disconnects the starting capacitor. The motor continues to run on 1ph power at the reduced horsepower. If the load on the motor is less than the de-rated capacity, all is well. The static phase converter can supply power to only one motor, must be connected exactly according to the instructions, and must be matched to the horsepower of the drive motor.

The rotary phase converter is more powerful and can supply multiple motors of different ratings. It is also more expensive, takes more room, and adds the noise of a second motor. It is a 3ph motor with additional components to start and run it: a motor starter, starting and running capacitors, and some means of disconnecting the starting capacitor. These are available as complete systems ready to connect to your machine tool or may be made from readily available electrical components to several different wiring diagrams. Also a rotary phase converter can be made from a static converter, a spare motor, and some running capacitors in a box.

George showed us the schematic of his "home-brew" 5hp rotary converter. After his talk he gave a demonstration in the grinding room of the machine shop.

Notes:
Static converters are not suitable for all machines. Consult the manufacturer of the converter before purchasing and installing.

I have not included the schematic of the phase converter that George built. It is available on the web from www.metalwebnews.com/howto/ph-conv/ph-conv.html. BAEM does not endorse or recommend this or any other do-it-yourself circuitry. This link is provided for your information only.

Phase converters should meet the requirements of Article 430 – Motor Circuits, Controller; and Article 455 – Phase Converters of the National Electric Code which has been adopted by your local enforcement agency. Article 460 – Capacitors, although not directly applicable, has the requirements for the safety discharge of capacitors.

George emphasized that charged capacitors are dangerous and can injure or kill. Capacitors can explode and therefore must be contained in substantial metal enclosures. All other electrical code, safety, and workmanship standards must be observed.