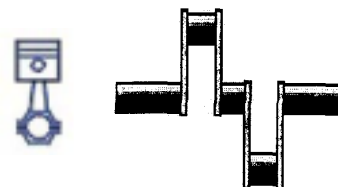


# The Crank Calls



President.....Ken Hurst.....(707) 257-2481.....icengine@mcihispeed.net  
Secretary.....Bob Kradjian.....(650) 343-7585.....bkradjian@aol.com  
Treasurer.....Lewis Throop.....(650) 941-8223.....lthroop@aol.com  
Events Coordinator...Dick Pretel.....(408) 732-6507...RPM10K@SONIC.NET  
Editor.....Bill Nickels.....(408) 739-2407.....whnickels@aol.com  
Tech Topics....Pat O'Connor.....(408) 733-3710.....pat1650@yahoo.com

May 2005

**NEXT MEETING**  
  
May 21, 2005 At  
Robert Schutz's Shop, 366 40th St. Oakland, CA  
  
**Doors open at 9AM**  
**Meeting Starts at 10 AM**

**TO JOIN THIS CLUB OR**  
**RENEW YOUR MEMBERSHIP**  
Contact Lewis Throop at  
27272 Byrne Park Ln.  
Los Altos Hills 94022-4324  
Phone 650-941-8223  
Email: lthroop@aol.com  
**MAKE YOUR \$25.00 CHECK**

### Meeting Notes

April 16, 2005  
Bob Kradjian, Secretary

President Ken Hurst called the meeting to order at 10:02.  
57 members and guests were in attendance.

Guests: Peter Gray came as a guest of Oscar Ortiz. Peter says he may return with his 10 year old son.  
Tracy Johnson was our other guest and is the son of member Bob Johnson.

Treasurer's report: We are in good shape with our paid up memberships. Our EDGE & TA dues are paid, we have insurance, and about \$2,000 on hand. For members who attend EDGE & TA meets, Lew Throop has your 2005 membership cards and buttons.

Special Events Coordinator, Dick Pretel, told us of our first engine show of the year at Hillsborough, May 1<sup>st</sup>. The field is at Ralston and Eucalyptus Avenues in Hillsborough. Tickets are available for members wishing to exhibit or help. Our total number of tickets allotted is fifteen.

Newsletter Editor. Our excellent editor, Bill Nickels, was involved in a serious automobile accident in San Diego. He was hospitalized with broken ribs, lacerations, and a collapsed lung. He is now back at home, but still hurting, and clearly unable to continue his editor duties. Our first concern is for his full recovery and we send our best wishes to Bill.

Our second concern is to continue to provide our newsletter to our members. We have a temporary fix for this coming newsletter which will be as follows: Mike Rehms will receive this report, add his photos, and compose them into an Adobe PDF file which will be available at our [baemclub.com](http://baemclub.com) website.

I can't stress how important the editor job is. I formerly belonged to a fine street-rod club that flourished for years, and had a spectacular newsletter. When the editor of the letter moved to another town, the club quickly crumbled and fell apart without a newsletter to inform the activities.

Another help to our club and editor would be to download and print your own newsletter from our Internet web site. This will spare the club the postage, paper, ink, and time for your newsletter. For anyone able and willing to help us in this manner, please let me know and I will compile a list.

Flash! A healing Bill Nickels just called and said that he is feeling well enough to continue with his excellent work at the newsletter post.

### Bits and Pieces:

Paul Bennett passed around a rare book, titled "A Listing of American Gas Engines since 1872" by C. H. Wendel. It seemed nearly every foundry and machine shop in the country produced a gas en-



gine in the “old days”. This book is out of print, but two used copies can be bought for \$240 and \$326 on Amazon!

I showed a unique, homebrew, single cylinder engine that appeared to have been built in the 1930’s. This engine was found at a scientific instruments show. The builder showed considerable ingenuity in fashioning an overhead valve,



pushrod engine that appears to be an original design (it is not listed in Holger Menrad’s volume III on U. S. engines). I plan to leave it intact, but will attempt to get it running.

Mike Rehmus had justifiable pride in showing us the very first issue of *The Model Engineer*. It is an altogether handsome piece of work with beautiful color plates and content. The 47 color plates were done on a 6-color digital Japanese printing press. Mike plans series of “beginner-build” articles. More advanced subjects planned include: John Vietti on magnetos, Bob Roach with a variable pitch prop, The Upshur boat engine, and a series of articles on the Morton engines (the M-5, the single, twin, and four-cylinder). A great job, Mike! We are pleased to see members Eugene Corl and Randall Cox featured.

Dwight Giles continues to mesmerize us with his ingenuity. The latest bit of magic is a gasket punch that produces a truly accurate, tiny product. This is for an oil sight-glass described for the hit and miss engine featured last newsletter. Using simple materials and techniques, he produced the gaskets while we watched. Hmmmm, maybe a small build article for Mike’s magazine?

Cor Langewis intrigued us with a very nicely condensed history of early steam engines. He illustrated the talk with his own model of a 1784 James Watt engine. Citing the need for water pumping from tin and coalmines as the impetus for early steam devices, he traced the history up to the era of early gas



engines. See Page 4, Carl Wilson’s additional details on his presentation.

Al Vassalo reached back into his seemingly inexhaustible supply of engines and brought a flame-licker that produces some real power. As usual, it is an original design of Al’s and features a unique reed valve. I asked Al if he had ever catalogued his numerous engines. He just may be the most prolific builder in our group.



It is with regret that we report the passing of a fine member of BAEM, Red Garlough. He was in the process of finishing his ’32 Ford roadster with a Replica V-8 engine. In previous years, he was one of the founders of MECA. Red passed away suddenly as a result of a heart attack. We had a fine visit with him at the Visalia show last year, and will cherish our memories.

**TECH TOPIC AT THE MAY 2005 MEET BY PAT O’CONNOR**

May is the month, I’ve decided, for you all to bring in those jigs, fixtures, gismos and whatchaclllits that you needed to make that special feature of your engine. We will have an open discussion session to give you a chance to tell us why it was needed and how you used it to make the part. Pat O’Connor

Photos by Mike Rehmus

The BAEM show crew had a great day at Hillsborough on May 1. Members Hurst, Gravatt, Pretel, O'Connor, Throop, Jasik, Jones, and Kradjian trundled their treasures to the beautiful site. Several hundred onlookers gave us a warm welcome. I counted 16 engines or displays. Consider coming along with the BAEM group on a future outing, even if you don't bring an engine. You will have a great time talking to the public and will give others a chance to look around, eat, or take the inevitable Port-a-Potty break. A good show to consider would be the Memorial Day outing at the incredible Blackhawk Museum in Danville.



Photos By Ken Hurst

## **TECH TOPIC**

4-16-05

Carl Wilson

### **Cor Langewis: A Brief History of Steam**

Cor presented a capsule history of the development of steam power using his model of a beam engine as an explanation aid. I (CW) have taken the liberty of ghost writing his presentation trying to maintain his flow of ideas and the emphasis he placed on them:

The great age of steam began with a simple observation. Thomas Savery filled a small flask with steam and corked the neck. He noted that the condensation of the steam into water pulled the cork into the flask. Steam displaced the air in the flask and its condensation created a vacuum. The force was the air pressure on the head of the cork outside the flask: 1 atmosphere = 14.7 psi. This was about 1700.



Savery built a number of engines that used steam and vacuum to alternately empty and fill a pair of vessels. They were not mechanical pumps and other than the valves used to admit steam and water into the vessels had no moving parts. Savery's engines were used to pump water for various uses, but could not be used in mines because the available steam pressure limited the lift to about 50 ft. The mines had reached a depth of 300 – 400 ft and pumping water from them would have required boilers and pumps to be installed at many levels underground. Ventilation of the combustion products would have been impossible.

Two valuable commodities were mined in England: tin and coal. Miners, following the ore bodies, had reached such depths that there were three major operational difficulties: pumping ground water from the shafts and galleries; ventilation: supplying fresh air to the miners and forcing explosive methane gas out of the mine; and hoisting the ore and miners to the surface. The readily available power sources: water, wind, and animal (including human) were insufficient to the task.

Thomas Newcomen built the first practical steam engine. The thermal energy of coal could be easily converted to mechanical energy to do a wide range of practical tasks. Newcomen's engines, unlike Savery's, were mechanical: cylinders, pistons, valves, and bearings; and the great rocking beam high above the engine room floor that coupled the piston to the pump rod. His engines were atmospheric, as were Savery's, and were very inefficient. They did not use steam at pressures above about 5 psi. The materials and techniques available limited boilers to a very low pressure. This restricted the available power.

We have described the setting for the entrance of James Watt: a critical need for mechanical power, not just in mines, but in a many industries; the hint provided by Newcomen's engine that this need could be filled by a steam-driven mechanical contrivance; and the appalling inefficiency of the Newcomen engine. The miners of Cornwall complained that it required a coalmine to operate a tin mine with a Newcomen engine.

The problem was the means of condensing the steam: cold water spraying into the cylinder at the end of the upward stroke. This cooled the steam and condensed it back to water, but also cooled the walls of the cylinder. The vacuum created in the cylinder "pulled" the piston down and the pump rod up lifting the water from the lower levels of the mine. (Of course, it was the air pressure on top of the piston that created the force.) At the end of the pump stroke, the piston is down, and the cylinder walls are cool. The steam valve is opened and the steam pressure together with the weight of the pump rod moves the piston up the cylinder. But the incoming steam contacts the cold wall of the cylinder, giving up heat energy to it until the cylinder is at steam temperature. This steam condenses without doing any useful work and is wasted. The major cause of the inefficiency of the Newcomen engine was this heating and cooling of the cylinder.

James Watt did not invent the steam engine: in the 26 years between 1764 and 1790 he changed it from a coal-guzzling monster capable only of lifting water into an industrial power source of much greater efficiency and utility. His first engines were still atmospheric, but the condensation of the steam took place not in the cylinder but in a separate vessel connected to the cylinder by a valve. This "separate condenser" allowed the cylinder to remain at steam temperature and removed the major cause of inefficiency. Watt also circulated steam in a steam jacket surrounding the cylinder to assist in maintaining its temperature.

In the 1780's Watt completed his redesign of the steam engine with major improvements. First in 1781 came the rotative engine where the reciprocating motion of the piston was converted to rotation of a shaft. Second, in 1782, Watt used steam on both sides of the piston. The steam engine was condensing but no longer atmospheric: it was now "double acting." Next, in 1784, the parallel motion linkage connecting the rocking beam to the piston rod was added. Watt considered this to be his most "satisfying" invention. Finally in 1788, Watt adapted the flyball governor to the steam engine to control its speed.

The steam engine, the first dependable mechanical energy source, inaugurated the Industrial Revolution and changed the world. From this power source came the factories that manufactured an unprecedented variety and quantity of goods as well as the railroads and boats that transported the raw materials and finished goods. The demand for better and more powerful engines was also a transforming force. From this came new materials, and manufacturing methods: the foundries and rolling mills; cast iron, wrought iron, and later steel; machine shops and boiler fabricating shops. This is a mechanical world using thermal energy converted to mechanical power to drive machinery to fabricate raw material into usable goods.

Thank you, Cor, for this fine presentation.

### 2005 Master Technician Competition - Irvine Ca.

BAEM club members George Gravatt (Napa, CA), Ken Hurst (Napa, CA), Bob Haagenson (Pomona, CA), and Roger Butzen (Pomona, CA), were invited to attend the 2005 Master Technician Competition on March 19<sup>th</sup> 2005 held at Mazda's North America Operations in Irvine, Ca. Many engines were on display for the top 12 Mazda Technicians in the country. We totally wowed them with our craftsmanship. The people at Mazda were great and rolled out the red carpet for us. What better place to show off the engines than at an event full of gear-heads! They requested the club to show in Sept. 2005 at a Rotary engine themed car show. Here are a



couple pictures of our display.

#### **Model Crankshafts and Camshafts**

**By Roger Slocum**

Hardened and ground alloy steel crankshafts

Web Site [www.cranksandcams.com](http://www.cranksandcams.com)

Email: [roger@cranksandcams.com](mailto:roger@cranksandcams.com).



I know I am close to your cutoff date for the BAEM News Letter, but this is the best I could do, time wise. I just came back from the foundry with the pictures. The castings are on there way to the Heat Treater, and I will pick them up on Tuesday, May 3rd., if all goes as planned. I will have 12 or 13 sets ready for shipment. The Drawings are completed, printed, and ready to be sent to the builders. I will be compiling the CD this weekend, and have them ready at the same time. Please see the attached pictures. One of them is for the Pacifier V-4, which is the 3/4" version. I am working on the drawings for that engine right now. I am also making a pattern for the Pacifier Cylinder Heads. Two are of the castings for the PeeWee V-4 Crankcase, Oil Pan, Bell Housing, and Cylinder Heads. And one is of the Match Plate for the Cylinder Heads.

Further, I am rebuilding the Air Press that Bob used to make the Radiator kits with. The punch and die were damaged, and needed to be replaced. I hope to be able to offer this item shortly, also.

Dirk Tollenaar

**FOR SALE**

Tree Journeyman 310 – 3 Axis CNC Mill  
DynaPath - Delta 10M Control  
Table 10" X 44"  
Spindle Taper 30NMTB With some tooling & manuals  
\$4500.00

David Palmer 707-938-2181  
Brian Palmer bdpalmer@sonic.net

Check out the BAEM Web Site at [www.baemclub.com](http://www.baemclub.com)

Send your project photos to the  
Web Master Jim Piazza.

Phone: 408-446-4825

Email: [jpiazza@ix.netcom.com](mailto:jpiazza@ix.netcom.com)

**Upcoming 2005 Events**

By Dick Pretel,  
Events Coordinator

**West Coast Engine Exhibitions For 2005**

3<sup>rd</sup> Annual Men, Metal, & Machines!

Visalia Conventions Center. Visalia, CA  
October 22 & 23, 2005. Phone: 1-800-789-5068.  
Web Site: [www.cabinfeverexpo.com/MMM](http://www.cabinfeverexpo.com/MMM)

**GEARS 2005**

September 24-25, 2005  
in Portland Oregon

**BAEM is invited to the following events**

By Dick Pretel, Events Coordinator

E.D.G.E. & T.A. Branch 113 Annual Show May 14, 2005  
Held at the AG museum, 4498 E. HWY. 140, Merced, CA 95340  
Free museum pass & lunch.

Blackhawk Automotive Museum, TBA

Gotelli car show Saturday Sept 27, 2005, 9AM-5PM

Good Guy's West Coast Nationals, Pleasaton August 26-28, 2005

Historic's at Monterey, TBA

**Model Engine Builder**<sup>TM</sup>

**A New IC Engine Magazine**

Focused on Internal Combustion Engines with build articles for the experienced and beginning modeler working with full-size or miniature machine shops. See our Centerfold engine stories!

**First Issue March 2005**

For more information, please visit [www.modelenginebuilder.com](http://www.modelenginebuilder.com) or  
1-866 996-8999 toll free in the U.S. & Canada

(01) 707 642-5381 elsewhere

Model Engine Builder Magazine is a publication of Elmwood Publishing<sup>TM</sup>