

# The Crank Calls



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**MEMBERSHIP \$25.00 US**

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**NEXT MEETING**

**Saturday, January 20, 2024, at the  
Golden Gate Live Steamers clubhouse site in  
Tilden Park, Orinda, CA**

Gate opens at **9:00 am**  
Meeting starts at **10:00 am**

**Upcoming Events**

- Jan 20: BAEM meeting at GGLS
- Feb 17: BAEM meeting at GGLS
- Mar 16: BAEM meeting at GGLS

See below for more details regarding events. Watch Crank Calls, BAEM emails and BAEM web page for updates. BAEM meetings are usually 3rd Saturday of the month except December.

**MEETING NOTES**

Bay Area Engine Modelers met at the Golden Gate Live Steamers clubhouse on December 9, 2023. There were 14 members/guests in attendance. BAEM President Paul Denham welcomed everyone to the December BAEM luncheon meeting, the club's annual potluck gathering.



## NEW MEMBERS/VISITORS

BAEM members are reminded that visitors are welcome at our club meetings, and we're always looking for new members.

## TREASURER'S REPORT

As a reminder, 2024 BAEM dues of \$25 are payable. Checks can be mailed to Deirdre Denham at 1937 Merchant St, Crockett, CA 94525. Make checks payable to "BAEM".

## CLUB BADGES

If you are a member in need of a badge, contact Mike Rehmus (mrehmus@byvideo.com) who has offered to produce them.

## SHOWS AND EVENTS

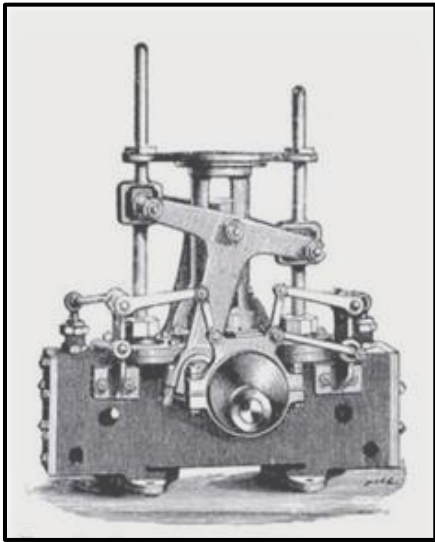
No upcoming shows/events during the next couple of months.

## FIRST POPS

No first pops reported this meeting.

## BITS AND PIECES

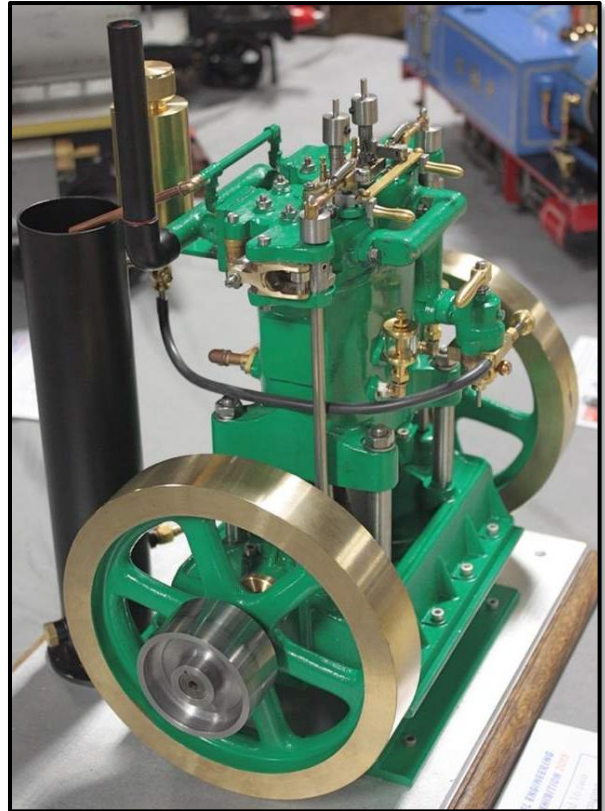
Paul Denham described two of his current engine projects. One is a two-cylinder Bernays steam engine of 1878 vintage. The Bernays is being built from bar stock.



*Drawing of Bernays steam engine.*

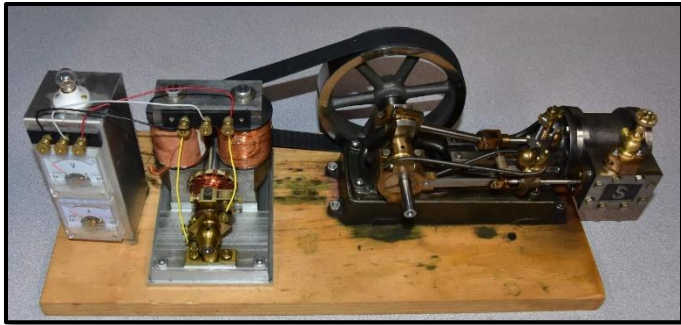
*Note the distinctive triangular connecting rod, connecting the two cylinders with the crankshaft.*

Paul's second project was a gift from Deirdre last Christmas (2022): a Frisco Standard casting kit. [Ed: A thoughtful spouse indeed!] This kit is a large two-cylinder ic engine model from Shelf Pet Models. Evidently, Shelf Pet Models is no longer in business, and she believes she got the last kit. Paul has already identified some challenges: missing parts and dimensioning errors in the plans. Club members will recall Paul, Dwight, and Mike Rehmus collaborated to cast missing bearing blocks.

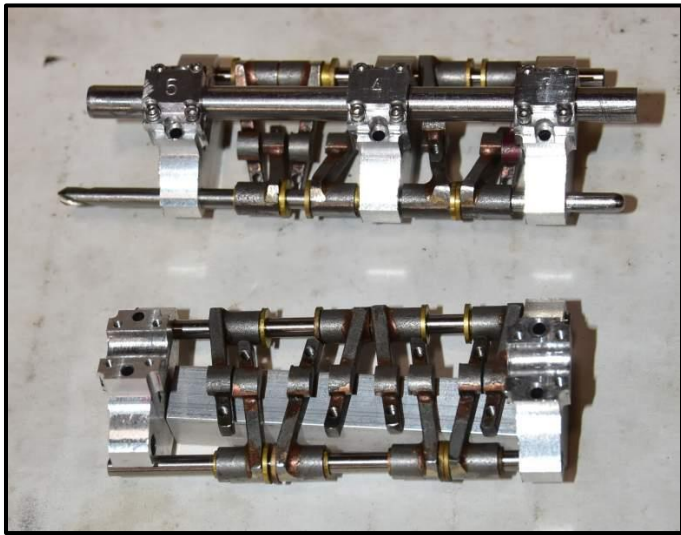


*A nicely finished Frisco Standard.  
Paul's version will likely look even better.*

As table decorations for the club luncheon, Peter Lawrence brought in his recently completed Muncaster Joy's Valve engine and his Stuart No 9 engine with a scratch-built dynamo. He also showed rocker arm assemblies for the retrofit of his in-line 4 with quattr-valves and a water-cooled head. He also offered to discuss master camshaft design for the very small camshaft lobes he needs for the project. (See below.)



*Peter's table decorations.*



*Peter's rocker arm assemblies.*

Charlie Reiter is working on an antique fire engine model. He showed a large brass air reservoir which is used to mitigate water hammer in the model water pump. He also showed the radius cutter he made to cut the interior profiles before parts were silver soldered together.



*Charlie explaining how he created a hollow brass air reservoir.*



*On the left is the radius cutter that Charlie used to cut the interior profile of the brass air reservoir, which is on the right. The air reservoir was made in two parts, which were silver soldered together.*

Mike Byrne brought in an aluminum pointing rod he inherited from his father-in-law. Of interest, the handle of the rod was a four-cylinder engine crankshaft. It was turned at the Fort Knox armor maintenance school.



*Mike Byrne's aluminum pointing rod. The handle was a four-cylinder engine crankshaft.*

## Tech Talk on Master Cam Design, by Peter Lawrence

To grind the cam shaft lobes for his V12 Merlin Peter built a cam lobe grinder. He started with a Sherline lathe base, to serve as an accurate reference surface on which to mount components. His quattr-valve retrofit of the in-line 4-cylinder engine requires grinding 16 cam lobes. Peter described his design process for a new master cam needed to grind the very small lobes required. Cam base circle is approximately  $\frac{1}{4}$  inch and lift is  $\frac{1}{16}$ th inch.

The three-arc cam design for model engines involves three circular arcs: base, flank, and nose. This is an improvement on the two-arc design, where the flank segment is merely a straight line between the base and nose circles. In theory, the three-arc design results in smoother, less jerky accelerations of the valve train. This increase in smooth operation yields less vibration, gives the cam more leverage against the high pressure on the exhaust valve during initial opening, and distributes some of the wear from the nose arc to the flank arc, increasing overall lifetime for the camshaft.

Peter's cam grinder relies on a "rocking shaft" design that utilizes a "master cam" that guides the grinding of the cam profile. The master cam isn't just a scaled-up version of the desired cam, instead it's a two-inch disk that has a  $\frac{1}{16}$ " lift (exact same lift as the desired cam). Should the master cam utilize the three-arc shape, or will it suffice to use the simpler two-arc design using a straight-line flank arc?

Peter's objective is to simplify the process of making a master cam, resulting in a cam profile that works well for a model engine. His previous master cams were tedious to make and generated less than perfect cams that required large amounts of subsequent polishing.

Many model engine builders rely on the "Master Cam Design" article by Don A. Bell in *Strictly IC*, Oct 1994. Peter believes that Bell missed a point. While Bell's approach uses a three-arc design (and satisfies the tangency requirements for smooth transitions from base to flank, and from flank to nose) it suffers from a much longer nose duration. This means that the cam coming out of the grinder will have a flank curve that more closely resembles a straight flank (two-arc design) than a curved flank (three-arc design).

According to Peter, Bell's geometry gives the wrong nose duration, while another geometry seems to generate the correct duration, but lift that's too high.

These different approaches appear to be the ends of a continuum of 3-arc solutions for the master cam, none of which meet the requirements for both correct lift and duration. The conclusion: the master isn't 3-arc, and to get it right might require going back to the old tedious methods for the flank.

Peter summarized his analysis as follows: "I have now done the 'tedious' work and proved to myself that the master cannot ever be a true three-arc design, but can be approximated with a three-arc design to better than model engine requirements."

## RAMBLINGS

Our Canadian correspondent, Carson Turncliff, shares a recent model engineering success story involving BAEM club members:

*Carson Turncliff here, from Canada...*

*It is Charlie Reiter's idea, for your newsletter, that I should give you a little example of how model engineering can bridge borders, thanks to your newsletter and the internet.*

*A couple of weeks ago, I finished my version of Philip Duclos's six cycle engine. However, it had a problem. It started easy enough, but after less than a minute it would just die. I got frustrated and sort of just left it.*

*Ended up telling Charlie Reiter, my 20 plus year internet friend, about the issue.*

*Charlie puts me in contact with your member Ray Fontaine. Ray and I ended up exchanging a few emails and he had several suggestions relative to solving my problem. I employed all his suggestions and then a couple more that came to light because of our discussion.*

*At the end of the day, my engine now starts and runs like the proverbial top. I felt the engine deserved to be mounted on a piece of polished stainless steel on a Rose wood base.*

*So, thanks to both of my friends in BAEM as well as internet technology for a happy ending.*

*I have attached a video of my engine as well as a couple of still shots.*

*Cheers...Carson*

Video: <https://youtu.be/zWzFcZX8UU0>



*Carson Turncliff's Duclos's six cycle engine*

Working on an interesting project? Got a great BAEM story? Share it with us here. Send us pics and project details, and your hard work will be shared with the entire club.

## FOR SALE

Owner of several Elmer Wall model engines seeks someone to get them in running condition and to improve their appearance. Amount of compensation to be negotiated. Contact Jeff Richards via email: [eatapeach78@yahoo.com](mailto:eatapeach78@yahoo.com)

Got something you'd like to sell? Your ad is free and will be seen by likely customers.

## NEWSLETTER CONTRIBUTIONS

Your contributions to this newsletter are appreciated: workshop reports, tech articles, reviews, historical pieces, whatever. You contribute, we'll figure out how to post it. Send your contributions to either or both of us. Thanks!

-Mike Byrne at [mgbyrne3@comcast.net](mailto:mgbyrne3@comcast.net)

-Wes Wagon at [weswag@ix.netcom.com](mailto:weswag@ix.netcom.com)

## Scott Overstreet

Scott Overstreet, long time member of Bay Area Engine Modelers, passed away in his sleep on the night of Dec. 15-16, 2023. He had been in declining health for about 2 years, was still active but a lot slower.

Scott was an electronic engineer for Sylvania/GTE Electronics and worked on many classified military projects. He never spoke of any of his projects.

Scott was the driving force behind the Tech Topics, a feature of many of our meetings, and sometimes delivered the topic himself or found a real expert. He retired from this after about 2 years, saying that he had run out of ideas. He passed Tech Topics to another club member.

His interest was primarily in antique hit-n-miss engines and tractors including crawlers. He owned an early Otto engine. Unfortunately, he was unable to restore and run this historically significant engine.

A memorial service will be held on Friday Feb. 2 from 2 – 4 PM at the Garden House in Shoup Park, 400 University Ave, Los Altos, CA.