Metro Detroit Metalworking Club

Newsletter

Volume 2, Number 2 (February, 1998)

NEXT MEETING

The February meeting of the Metro Detroit Metalworking Club will be a field trip and meeting at the H.R. Kruger machine company starting at 7pm on Wednesday February 18th. Club member Mike Newhouse, who is the supervisor of the machine shop at Kruger, will show us their latest CNC machining centers and other machines in their immaculate machine shop. Please bring your own safety glasses with side shields if you have them, Mike will have some to loan out. Mike would also like to have an estimate of how many members will attend, so please e-mail me, Bob Lorenz
Leave a message on the machine if I am not home,
if you plan to make the field trip - as soon as possible, please.

H.R. Kruger is at the intersection of old Grand River and Orchard Lake Road in the City of Farmington. If you are coming out 696 you can exit at Orchard Lake Road and head south just a little over 3 miles on Orchard Lake Rd. H.R. Kruger is on the North West corner of Grand River and Orchard Lake Rd. A Jax car wash is right next to Kruger's. Park in Kruger's parking lot and use the back door in the north east corner of the Kruger building this is next to the wall dividing Kruger from Jax car wash.

We plan to have a short club meeting also, bring your projects if you like, I know some of the guys at Kruger would like to see what we are doing.

- Bob Lorenz

MACHINE TRADES OPEN HOUSE

On the same evening, Wednesday, February 18th, Chip Greene will be hostng a machine trades open house from 6pm at Huron High School. Huron High School is located west of Flat Rock on Huron River Drive, across the street from Michigan Memorial Cemetery. 32044 Huron River Drive, New Boston, MI. 782-1436.

MEETING NOTES

SOUTHFIELD, MI. Thanks to **Bob Lorenz**, our January meeting was again held at the old fire station in the Historic Burgh Center in Southfield.

We were please to welcome several new members, including **Bob Fuhrman**, **Paul Amaranth**, **Larry**

Chenault, and **Tony Gubacz**. As well, we now have our first "Internet" member - **Paul Pierce** of Arizona - thanks, Paul!

Mike Newhouse of H. R. Kruger generously offered a tour of their shop for our next meeting. Everyone thought this was a wonderful idea; thanks are due to Mike and to the people of Kruger.

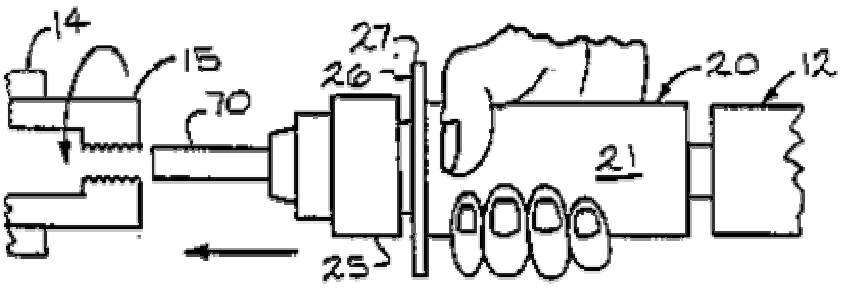
Brian Whitfield brought a completed model steam engine he made from castings, as well as the boiler that he is currently working on. Both looked great. Rumor has it that someone else brought a Stirling cycle engine, but I missed that.

The core of the meeting consisted of two presentations, one by Al Roth and another by Frank Bennett.

Al Roth spoke of a remarkable tapping/threading tool for the lathe tailstock. Al invented and patented this tool (US Patent 4,879,929; many US patents, including this one, are available online on the IBM Corporation Patent Server at: _____). He began developing it while teaching machine shop, and developed it further as it proved useful. It is sold by Smithy under the name "Smithy EZ-Tapper," and is manufactured in China. (It should not to be confused with another hand-operated device called an "EZ-Tapper.")

Basically, this tool consists of a tapered shank which mounts in the lathe tailstock. A cylindrical body is mounted on this shank and is formed in such a way that it can slide out (to the left, away from the tailstock) along the shank. It is spring-loaded, so that it tends to return to its original position (nearest the tailstock). During the first eighth of an inch or so of this longitudinal movement, the tapper cannot rotate; once it is further out, however, it rotates freely. At the left end of the tapper are mounted a polycarbonate hand guard and a jacob's chuck.

The two illustrations below are taken from the patent on this device.



...

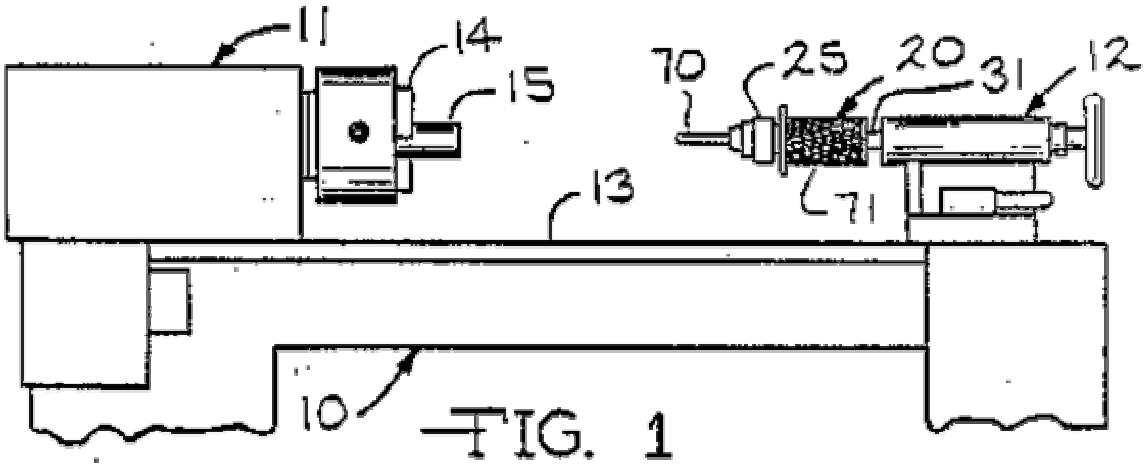


FIG. 1

This tool can be used in its simplest application as a rather long tailstock drill chuck to drill a workpiece mounted in the lathe. Because the EZ-Tapper cannot rotate while in its rightmost position (where it is held both by its spring loading and by the pressure of the drilling operation), it does not rotate during drilling.

Once a hole is drilled, a tap is placed in the EZ-Tapper. The lathe is put under power and the tap is advanced by hand until it engages the workpiece. Thereupon, the motion of the lathe and workpiece draws the tap into the hole, tapping the hole. The lathe tailstock remains fixed, and the EZ-tapper body moves leftward. Upon completion of the tapping operation, the tapper's body is free to rotate with the workpiece. To remove the tap from the tapped hole, the lathe's direction of rotation is reversed, unscrewing the tap from the tapped hole.

Similar steps may be employed for threading (using a die holder in the EZ-Tapper) and for reaming.

Al also spoke of the patenting process, both from a technical and from a business perspective. He noted the importance of finding a patent attorney who understands your field. Beyond the patenting process, he emphasized that the hard part in any invention isn't the patent, but rather is getting the invention to market. He suggested that before beginning the expense and work of the patent process that it would be wise to do a market analysis, a manufacturing analysis, and a business analysis.

Al's presentation sparked a considerable discussion, both on his invention itself and on the patent process.

It should be noted that the discussion here is simply one listener's interpretation of Al's excellent presentation. This account may contain errors, and is not intended as a substitute for the appropriate instructions for the safe use of this tool.

Frank Bennett then gave an elaborate and fascinating presentation on lost was casting. Frank has used this process to manufacture jewelry and other small items with a great degree of detail. He passed around a most impressive set of cast trilobite fossils as well as some intricate rings.

As Frank described the process, one begins with a model made in wax. This wax model can be made directly, by carving or machining it out of wax. It can also be made indirectly, by first making a mold and then casting one or more models in wax from that mold. This is the process that Frank most often employs. The advantage here is that because this is a **lost** wax casting process, the wax model is destroyed during the casting process. By first making a mold for making wax models, many copies can

...

be made.

The molds Frank showed us were rubber molds made from a special rubber molding compound (available from jewellers' supply houses). Frank generally creates a two-part mold (front and back).

Most of Frank's equipment is shop-made, and displays considerable ingenuity. Once the mold is made, it must be filled with wax by a wax injection machine. Rather than purchasing such a machine, Frank made one out of an old crock pot.

Frank also displayed a shop-made vacuum device. Once a wax model is cast, it is placed in a stainless steel cylinder and surrounded with a substance called "investment." Investment comes in powdered form and must be mixed with water. In doing so, air bubbles can form in the investment; these air bubbles can ruin the surface finish of a casting. For this reason, the mixed investement is placed on a vibratory table, covered, and subjected to a vacuum. This tends to remove the air bubbles trapped in the investment. Frank's vacuum pump is constructed out of an old auto air conditioner compressor, driven by a 1/4 hp motor.

Finally, Frank's kiln is shop-made as well. This kiln is used twice in the casting process. First it is used to "burn out" the wax from the investment - leaving the investment as a mold hollowed out with the shape of the wax model. Then it is used to melt the metal which is poured into this mold, creating the casting itself. In jewelry manufacture, Frank often casts in gold and silver.

Frank covered this process in much greater detail than can be described here, passing along a number of tips. Although he didn't do any actual casting during the presentation, the display of his equipment was quite enlightening.

Once again, it should be noted that the account here is simply one interpretation of a presentation. This account may contain errors and is not a substitute for proper training procedures in lost wax casting. Metal casting is a process with inherent dangers; it should not be attempted without a thorough knowledge of and training in the processes involved.

Thanks to both Al and Frank for excellent presentations. Each of them could have easily occupied the entire meeting.

The meeting concluded with a sort of a free-for-all around approximately 125 pounds of steel and aluminum cut-offs supplied by Mike Newhouse and **Jim Schrot** of H.R. Kruger. I personally got enough aluminum to last me through another five projects on my tiny Sherline lathe. I only wish they were giving away time as well as materials - but even the Kruger machine shops are not advanced enough to manufacture time. Thanks from all of us to Mike, Jim, and the folks at Kruger.

In general it was a very good meeting. I had to leave half an hour after our nominal closing time, and yet there were still many people talking.

- David M. MacMillan

FROM OUR PRESIDENT

From Bob Lorenz, our President:

Anybody care to volunteer to do a presentation for our March meeting? If so, contact me to make any arrangements needed.

INTERNET

Don't forget to check out our expanded list of local metalworking suppliers:

We're currently looking for recommendations of favorite metalworking, engineering, or model engineering related web sites. These could be sites which contain resources for the amateur metalworker, sites featuring model engineering projects, or general industrial or engineering sites with information of use or interest to amateur metalworking and small-scale engineering. If you have any to suggest, please contact either Brian Whitfield or David M. MacMillan

The club's web page is at:

FOR SALE OR TRADE

Dan Hittenmark has a shaper and wants to sell the shaper or trade for a small lathe working or not. Contact him at _____ or

---

Return to the _____ Home Page.

...