May 2018
Newsletter

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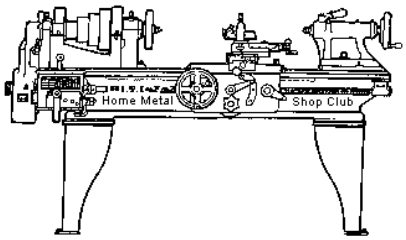


http://www.homemetalshopclub.org/

The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area since its founding by John Korman in 1996.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members enjoy getting together and talking about their craft and shops. Shops range from full machine shops to those limited to a bench vise and hacksaw.

If you like to make things, run metal working machines, or just talk about tools, this is your place. Meetings generally consist of ***general announcements***, an ***extended presentation*** with Q&A, a ***safety moment***, ***show and tell*** where attendees share their work and experiences, and ***problems and solutions*** where attendees can get answers to their questions or describe how they approached a problem. The meeting ends with ***free discussion*** and a ***novice group*** activity, where metal working techniques are demonstrated on a small lathe, grinders, and other metal shop equipment.

President	Vice President	Secretary	Treasurer	Librarian
Brian Alley	*Ray Thompson*	*Joe Sybille*	*Emmett Carstens*	*Ray Thompson*
Webmaster/Editor	Photographer	CNC SIG	Casting SIG	Novice SIG
Dick Kostelnicek	*Jan Rowland*	*Martin Kennedy*	*Tom Moore*	*John Cooper*

This newsletter is available as an electronic subscription from the front page of our website. We currently have over 1166 subscribers located all over the world.

About the Upcoming 9 June 2018 Meeting

The next general meeting will be held on 9 June at 12:00 P.M. at the South Houston Branch Library located at 607 Avenue A, South Houston, TX 77587. Martin Kennedy will give a presentation on "I Bought a 3D Printer - Now What?".

Visit our website for up-to-the-minute details, date, location maps, and presentation topic for the next meeting.

General Announcements

Videos of recent meetings can be viewed on the HMSC website.

The HMSC has a large library of metal shop related books and videos available for members to check out at each meeting. These books can be quite costly and are not usually available at local public libraries. Access to the library is one of the many benefits of club membership. The club has funds to purchase new books for the library. If you have suggestions, contact the Librarian *Ray Thompson*.

We need more articles for the monthly newsletter! If you would like to write an article, or would like to discuss writing an article, please contact the Webmaster Dick Kostelnicek. Think about your last project. Was it a success, with perhaps a few 'uh ohs' along the way? If so, others would like to read about it. And, as a reward for providing an article, you'll receive a free year's membership the next renewal cycle!

Ideas for programs at our monthly meeting are always welcomed. If you have an idea for a meeting topic, or if you know someone that could make a presentation, please contact Vice-President Ray Thompson.

Recap of the 12 May 2018 General Meeting

By *Dick Kostelnicek*, with photos by *Jan Rowland*

Nineteen members attended the 12:30 P.M. meeting at the South Houston Branch library, 607 Avenue A South Houston, TX 77587. There were two visitors, Tom Schwab, our speaker, and Brian Alley's, our president, wife. Two former members, Mike Hancock and Dean Hemming, also attended the meeting. There are 32 members in good standing with the club. President Brian Alley (left photo) led the meeting.

Presentation

Tom Schwab described the process and equipment that he has used to produce thin shell bronze castings and plaques by the Lost Wax or Investment method. Located near his shop in Houston, TX there is a commercial foundry specializing in investment casting. Tom frequently helps out at that foundry and is allowed to produce his own works there.

A typical project starts with a 3D object to be cast that is sculpted from clay, plaster, etc. This is dusted with a parting agent and covered with a mold made from latex or silicone rubber. The mold is removed

from the object by cutting it into sections and subsequently reassembled. Molten wax is poured into the mold and allowed to harden adjacent to the mold's surface. The excess wax is poured out leaving a thin shell in contact with the mold. The rubber mold is removed by opening it along its parting lines. Next, the wax impression is covered inside and out with a fine wet silica sand containing a binder. Many coats are applied and they are allowed to harden between coatings. Silica sprues and headers are glued to the casting containment to facilitate subsequent pouring of molten metal. The containment is then burned out in an oven and all traces of wax are removed. What remains is a silica containment into which molten bronze is poured. The bronze metal is about 88% copper and 10% tin and is poured at around 1742 degrees F.

For large sculptures such as a statue, many small pieces are cast and they are subsequently TIG welded together. To finish a project, a typical bronze casting is sanded and polished smooth and then treated with an acid wash to give an aged appearance.

Presentation slides at this link.

Safety Video

A safety video was shown concerning when it is appropriate to wear gloves when operating various machines . Some places not to wear gloves are when using a drill press, power saw, and grinder as the cutting edges on these machines can catch the glove and thereby pull ones hand into the machine's mechanism.

Show and Tell

John Hoff showed a technique that he is uses to connect two like size metal tubs end-to-end. He presses three or four indentions into one tube's end thereby rendering its effective outer diameter just small enough to slip into a like un-crimped tube.

Jan Rowland demonstrated the use of a caliper that he gave away as it was surplus to his needs.

Jon Cooper talked about a huge clutch mechanism producing 100,000 ft-lbs of torque that he saw at the recent Offshore Technology Conference in Houston, TX.

Richard Pichler displayed a bunch of old tools that he obtained at a recent garage sale (left photo).

Dean Henning showed some pictures of his CNC mill (right photo) and Mathews lathe.

Richard Douglas described his positive experience with a Chinese mail order,

about $200, 3D, printer that he is assembling.

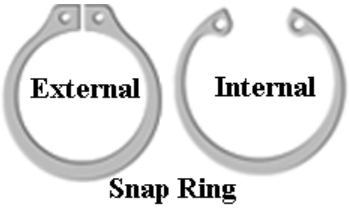
Brian alley showed a few 3D printed replacement parts used in his shop,

Articles

Bending an Arc

By Dick Kostelnicek

A segment of a metal circle of uniform thickness, when bent by applying compressive force to its ends, will not retain its circular shape. In fact it will bend more near its center and progressively less near the ends. We compensate for this bending variation by increasing the segments thickness at its center and tapering the thickness toward the ends. This principle of varying the arc segment's thickness is seen most often in the following three devices: leaf spring, bow and arrow, and the True Arc retaining or snap ring.



For the leaf spring, the vehicle's axle is connected below the center or thickest part of the spring. One end of the leaf is pinned to the vehicle frame but allowed to rotate. The other end is shackled and allowed to move mostly horizontally as the spring flattens and elongates under load. When the spring is compressed, it retains a circular arc shape, all-be-it with increasing arc radius. Were it not for the increased thickness near its center, it would bend excessively there and possibly break or become irreversibly bent due to high vertical load afforded by the vehicle's axel.

The case is similar for the bow and arrow. As the string is pulled back at its center, the bow flexes and would bend mostly at its center were it not for the increased thickness there. By having a variable thickness in its shape, the bow retains a mostly circular shape of decreasing radius as force is applied to the string.

The True Arc ring (sometimes called a cir-clip or snap ring) is used to prevent a round part from moving axially along a shaft (external ring) or stop a piston from translating within a bore (internal ring). These rings fit or snap into an external grove cut on a round shaft or an internal groove within a round bore's wall. In order that they fit snugly even though the diameter of the grove may vary from shaft-to-shaft, these rings need to retain a prefect circular shape on the side of the arc that is in contact with the grooves base as they are expanded or compressed during attachment or insertion. Hence, the rings have a variable thickness; thicker near the center of the arc and thinner toward both ends.