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FOR THE BEGINNER # 23

Hand Reamers

Holes produced by drilling are seldom accurate in size and often have rough surfaces. A reamer is used to finish a hole to an exact dimension with a smooth finish. Hand reamers are often used to finish a previously drilled hole to an exact dimension and a smooth surface. When parts of machine tools are aligned and fastened with cap screws or bolts, the final operation is often the hand reaming of a hole in which a dowel pin is placed to maintain the alignment. Hand reamers are designed to remove only a small amount of material from the hole- usually from .001 to .005 in. These tools are made from carbon or high speed steel.

Hand reamers have a long starting taper that is usually as long as one-third of the fluted body. This taper is usually very slight and may not be apparent at a casual glance. Hand reamers do their cutting on this tapered portion. The gentle taper and length of the taper help to start the reamer straight and keep it aligned in the hole.

The full diameter or the actual size of the hand reamer is measured where the starting taper ends and the margin of the land appears. The diameter of the reamer should be measured only at this junction, as the hand reamer is generally back tapered or reduced in outside diameter by about .0005 to .001 in. per inch of length toward the shank. This back tapering is done to reduce tool contact with the work piece. When hand reamers become dull, they are resharpened at the starting taper, using a tool and gutter grinder.

The function of the hand reamer is like that of a scraper, rather than an aggressive cutting tool like most drills and machine reamers. For this reason hand reamers typically have zero or negative radial rake on the cutting face, rather than the positive radial rake characteristic of most machine reamers. The right hand cut with a left hand helix is considered standard for hand reamers. The left hand helix produces a negative axial rake for the tool, which contributes to a smooth cutting action. Most reamers, hand or machine types, have staggered spacing on the teeth, which means that the flutes or body channels are not precisely of uniform spacing. The difference is very small, only a degree or two, but it tends to reduce chatter by reducing harmonic effects between cutting edges. Harmonic chatter is especially a problem with adjustable hand reamers which often leave a tooth pattern in the work.

More on reamers next time.

Wes Ramsey

Last month's meeting was at **Grant Carson's** and produced a good variety of projects. With the larger space available in Grant's shop, it seems more members are bringing their wares to show. Thanks again Grant.



December's meeting is again scheduled for Grant's. Directions are below and a map is included elsewhere.

Saturday, December 9th, 2005, 1:00 pm.
Grant Carson's Tool and Die Shop.
Unit C, 7360 SW Bonita Road, Tigard, 97224

Directions to Grant's:

From I-5 use exit 292 to Hwy 217, go north about 1/4 mile toward Beaverton to SW 72nd exit. Turn left on SW 72nd Ave, go about 3/4 mile to Bonita Road, turn right. A & G will be on your left.

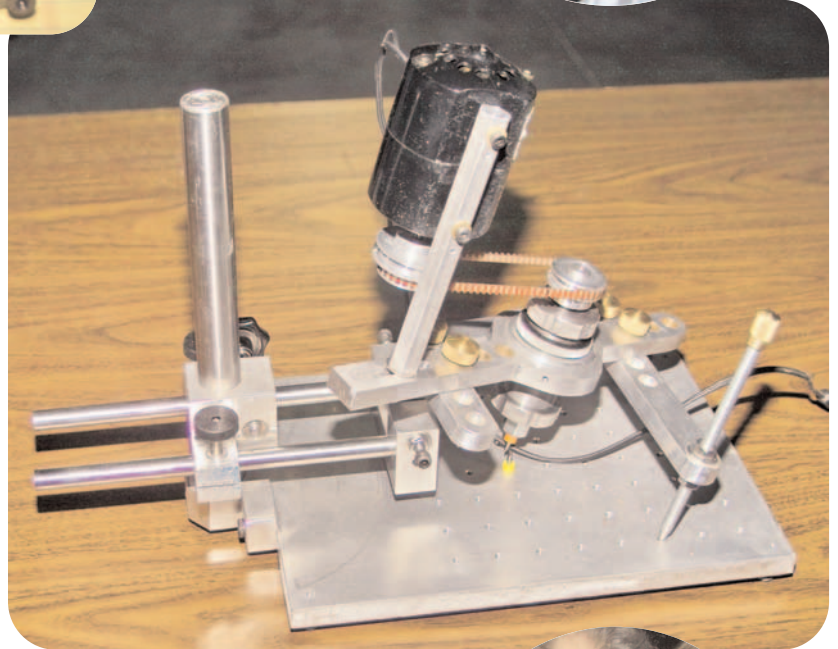
From Hwy 99 (Pacific Ave.) turn south on SW 72nd Ave, proceed about 1-1/2 mile to Bonita Rd, turn right. A & G will be on your left.



Kevin Klaviter (right) brought the parts he's made for his gas engine (left). Included are the crankshaft, connecting rod and main bearings. Impressive job Kevin. I wonder if it will be running for the next meeting.



Bob Grove (pictured at left) brought the clever Pantograph shown at right. Its a lot more compact than most but appears to offer enough flexibility for most modelers. Good job Bob.

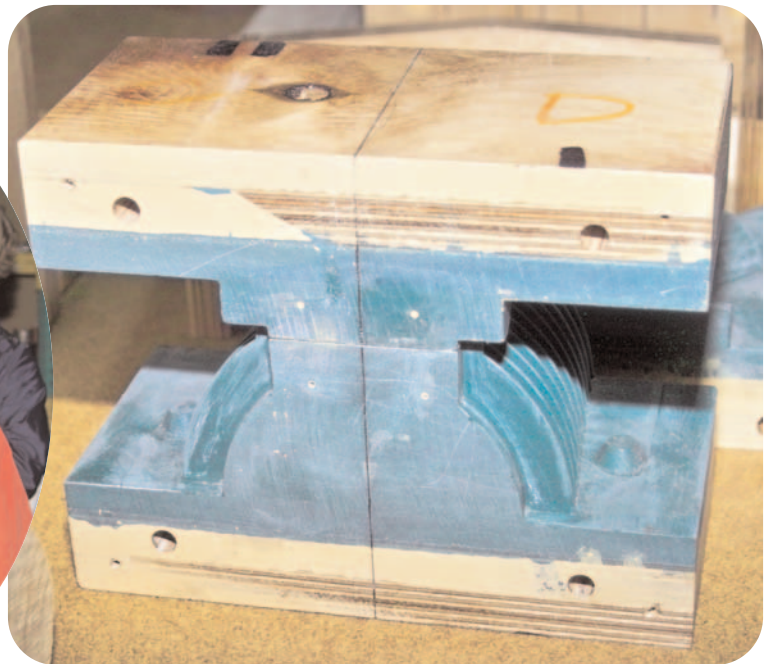


Virgil Jeffries, shown at left, demonstrates that he can make more than precision Harley engines. He described the precision die in a die in a die novelties pictured below. Based on the size of these objects, Virgil must have much better eyes than the rest of us.



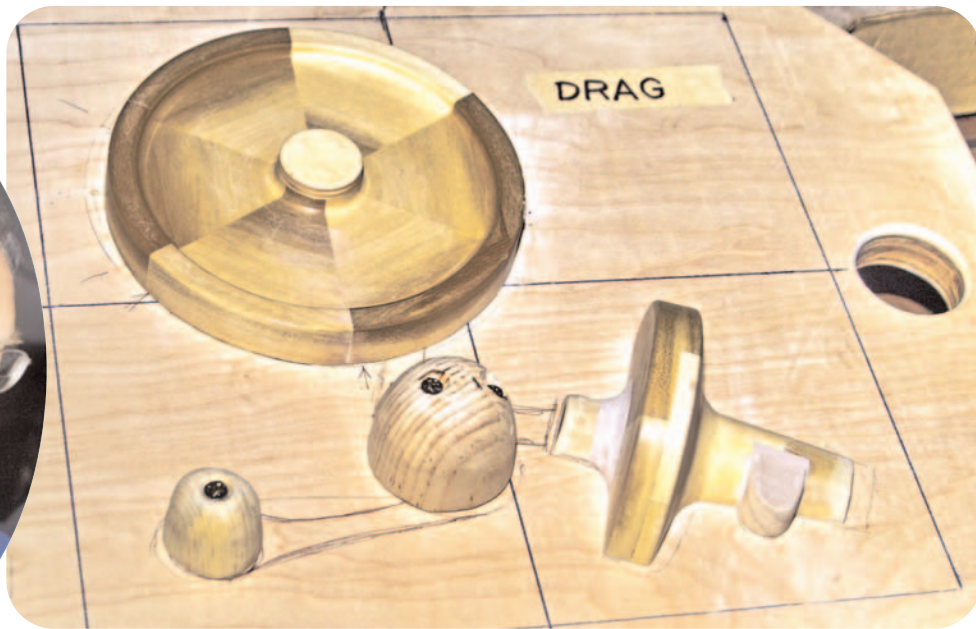
At right **Dave Carr** describes the modification he made to the Armstrong hand shaper. Dave said his biceps were getting too big due to continued use of the shaper so he decided to add a motor to the unit as shown below.





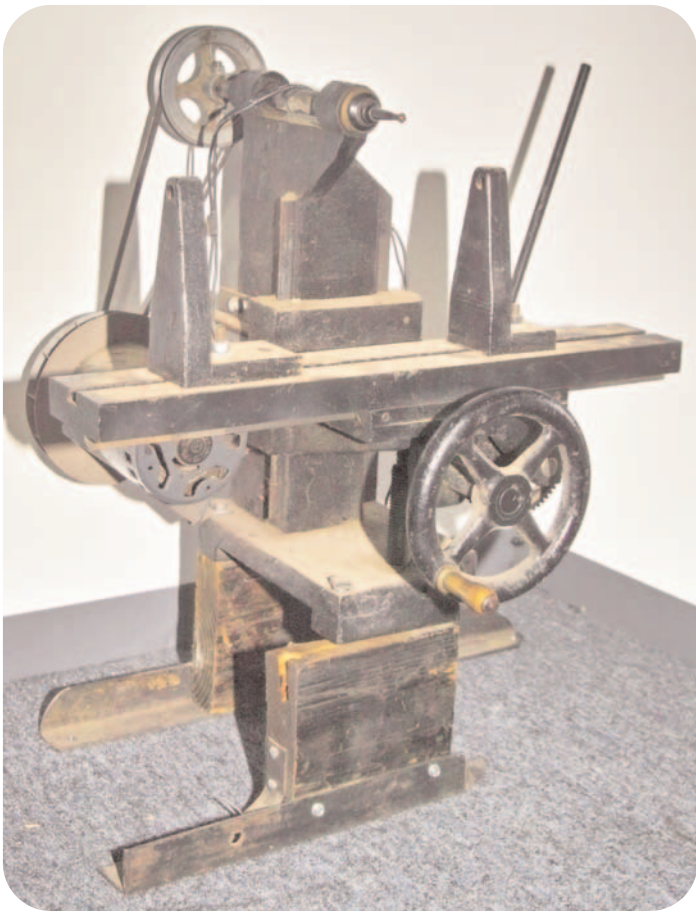
Above center is pattern maker guru **Gary Martin** holding an antique engine (shown in detail at upper left) for which he is making the required numerous patterns - one of which is shown at upper right. Gary explained some of the vagaries of making patterns for complicated machines like this.

At right, **Carl Petterson** describes the pattern he is making (at far right) that will soon be used to make a casting for the famous pillar tool.



Below is shown many castings of anchor parts poured by **Bud Statton** (lower right). Bud is making these available to members for a nominal fee.





Grant Carson had the milling machine (pictured at left) on display. Little is known about it but popular conjecture pointed to a machine which can mill the mica from the armatures of electric motors.

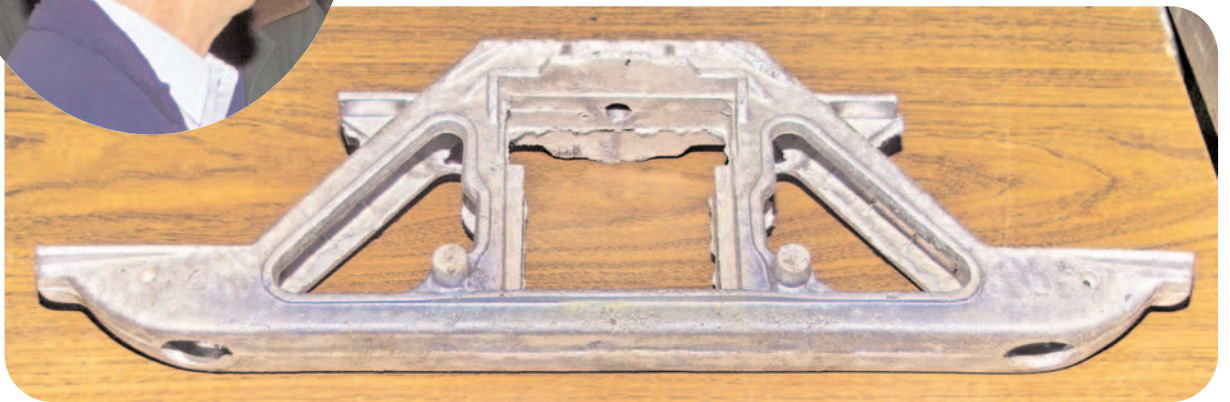


At upper right is **Al Pohlpetter** who brought a cigar cutter disguised as a model steam engine and boiler. It's a real cutie but unfortunately it's picture is not available.

At right **Henry Casson** described his efforts in making clock parts - wooden replicas of which are shown directly below.



Bill Mitchell (below center) continues his large scale model locomotive parts production. Here he describes the signal (at left) and the aluminum casting (below) he made of a part for a locomotive boogie.



**Directions to Grant Carson's A&G Shop
7360 SW Bonita Rd, Tigard, OR 97224**

