

Tricks with a Metal Cutting Lathe

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Threading a Rod

One item a friend / customer has me fabricate are sets of hooks used to suspend his rifle collection from the ceiling. The design of the racks require the upper end of the hook to be threaded (1/4x20) for about a 1/2 inch. It's not easy to thread a rod using a hand die and if you have to thread dozens of rods, it's a decided pain., so I went looking for a solution.

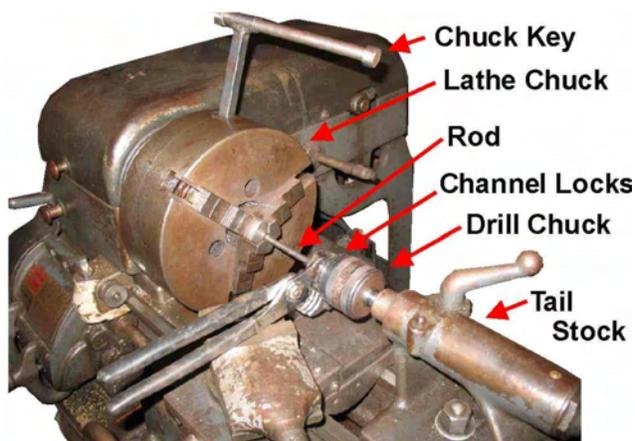
What I came up with is shown below. First, I dug an old, chewed up drill chuck rescued from my shop fire (20 years ago - smiths never throw out something with some life left in them!). The chuck was worn, covered with fire scale and locked up solid. A bit of soaking in Kroil (from Kano Labs) broke it free. I purchased a Morse Taper (#2) with the appropriate Jacobs taper for the chuck (6 JT @ \$4.22) from Enco so it could fit into the tailstock on my Logan lathe. Next, I



Figure 1: Drill chuck, die & spacer

discovered that some tiny 1/4x20 hex dies I had in the reserve just happened to fit into the chuck. The chuck wasn't quite capable of holding the die as tightly as I would like, but slipping a length of pipe of a convenient diameter (plus a copper shim) behind the die solved that problem (Fig.1).

To thread a rod (Fig.2), I grind a pint onto the end of the rod, then lock the rod into the lathe chuck. I loosely insert the drill chuck into the tail stock so the drill chuck can still rotate.



The tailstock is slid towards the rod until the die contacts the rod and I turn the drill chuck by hand until it starts to bite. A set of channel locks is positioned to grasp the drill chuck. The channel locks are closed (preventing the drill chuck from moving), and using the chuck key as a handy lever, the lathe chuck is spun CCW a half turn. I then release the piler's grip, and spin the lathe chuck back to the starting point. Repeat 10 to 11 times completes the job.

The advantage of this scheme is that the rod is held precisely at right angles to the die and there is plenty of mechanical advantage. The process takes maybe a minute or two per rod.

Marking a Center

One of the usual procedures when using a metal cutting lathe is to drill a small depression at the center of one end of the piece of stock to be lathed. The unmarred end of the stock goes into the lathe chuck and the live center in the tail stock is inserted into the depression. The depression is typically created using a spotting drill bit or a combo drill and countersink held in a drill chuck inserted into the tail stock. The stock is locked in the lathe and the tail stock is positioned and locked down so that business end of the bit is close to the stock. The stock is spun and the drill bit advanced into the stock to make a depression exactly at the center of rotation. Unfortunately, if the drill chuck is 100%, the problem with the die mentioned above is likely, i.e., the bit or countersink tends to gradually vanish back into the drill chuck. A small bit of tubing of the diameter of the bit or a bit smaller dropped into the chuck behind the bit solves the problem.

Marking Drill Bits

The problem noted above for spotting bits, countersinks and / or dies also applies to drill bits too - bits tend to get shoved back into the drill chuck. While the solution mentioned above could be used, having a set of tubes or rod sections standing by isn't very practical but the solution is now available. There are bow drill bits with three flats on the butt end. These are usually sold for use with battery powered hand drills but they work well on lathes too. I'm a great believer in the perversity of the universe, i.e., if you have a backup tool, the one in use will last forever and if you don't have a backup, the one in use will break at the most inconvenient time. Since I use only a few sizes of bits on the lathe and since, I bought multiple copies of the bits in those sizes. The problem is now one of storage. How do I mark the backup so only one of the bits is actually in use and getting duller? The answer is to melt a blob of wax onto the end of the bit in reserve. The blob protects the edges and marks the bit as the one not in use. Wood workers typically do this on router bits as well.