TSME Hints & Tips - April 2019

Toronto Society of Model Engineers

2019-03-22

Removing a Tap or Drill from a Non-Ferrous Component

To remove a steel drill or tap from brass, bronze, or aluminium, mix Alum in warm water, until it will take no more Alum. Drop the part in the liquid and heat to close to boiling. The solution will eat away the steel slowly. Extract from solution and try to to shake out the steel part, redo as necessary until successful.

Alum can be found at the local supermarket in the isle with the bottling and pickling supplies, or with the spices.

Copper Sulfate as a Marking-out Aid

Prior to marking ink becoming ubiquitous, many toolmakers used copper sulphate solution for marking out steel or iron. Copper Sulphate is also better for machining to a scribed line, as the swarf stands less chance of rubbing away the copper sulphate as it often does with marking blue. You can purchase copper sulphate from e-bay. Just mix it with water in a jar so it is a dark blue colour then it will keep for a very long time.

There is a two points when using copper sulphate. The surface to be coated must be totally clean and free of oil and grease etc. This is because there is a chemical reaction where the copper replaces the the top layer of iron of the item being treated. In fact where the copper sulphate solution is applied the item is effectively copper plated, albeit a very thin layer, and this is securely bonded to the underlying metal. The other point is that the item should be cleaned thoroughly afterwards as there will be traces of ferrous sulphate on the part, which is corrosive.

Electroplating in the Workshop

A recent talk regarding electroplating was very interesting. Members may be interested in further information regarding this topic in the book Workshop Practice Series, # 11 - Electroplating by J. Poyner, available from the TSME Library and from Toronto Public Library.

Removing a Drill Chuck from the Arbour

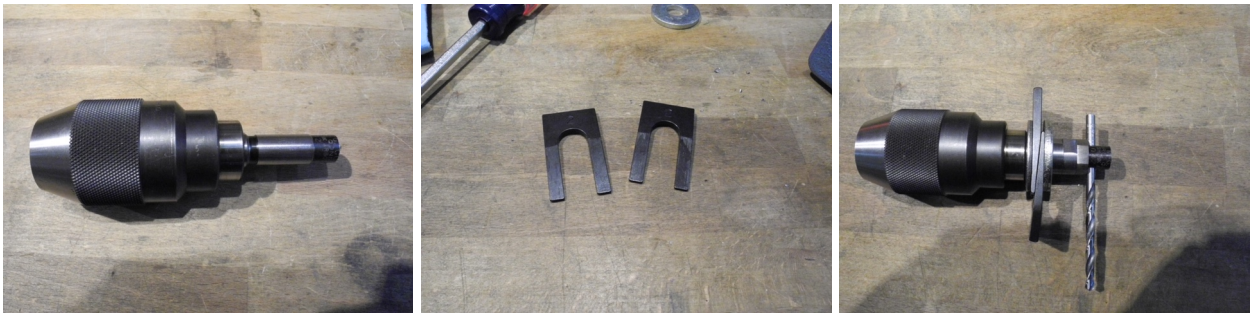
To remove an arbour from a drill chuck (see figure 1a) purchase or borrow a pair of Jacobs removal wedges (see figure 1b) available from tool merchants or a friend.

The two wedges are placed between the chuck and the collar on the arbour (see figure 1c). In thus case there was no collar, so the cross hole in the arbour was used along with a slip shaft over the arbour and two substantial washers. The slip shaft was held in place by the twist drill, which turned out to be a bad choice, as the drill was bent in the extraction process. This was probably because the drill was a very loose fit in the arbour cross-hole.

Pressure was applied to the wedges using a machine vice (see figure 2a).

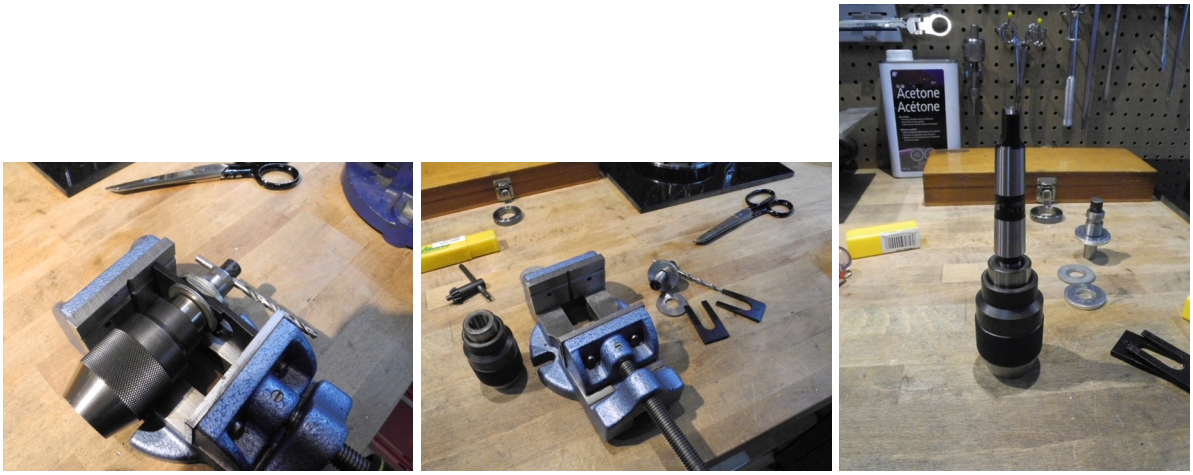
Note the new arbour, which has a collar for removing from the chuck, and a relief grove half way along the taper (see figure 2c).

When using this form of arbour, care should be taken not to push hard the arbour into the barrel of the tail stock of the lathe, or the mill spindle, until the relief is well inside the taper, as force can create burrs in the taper opening and cause misalignment.



(a) Chuck and Arbour (b) Removal Wedges (c) Wedges in Place

Figure 1: Removing Drill Chuck from an Arbour



(a) Expanding Wedges with Vice (b) Chuck and All the Components Used (c) Drill Chuck With Correct Arbour

Figure 2: Removing Drill Chuck from an Arbour