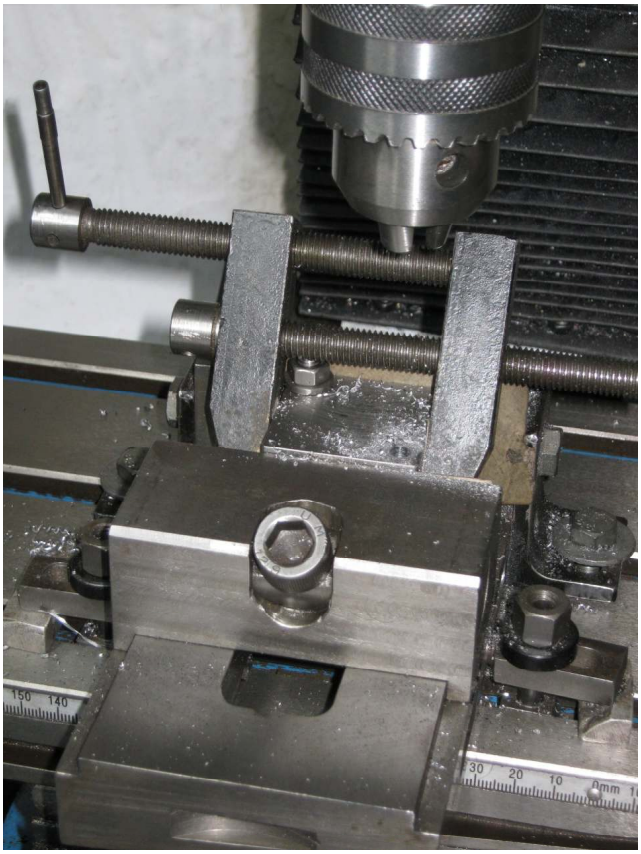
Gasket Punch

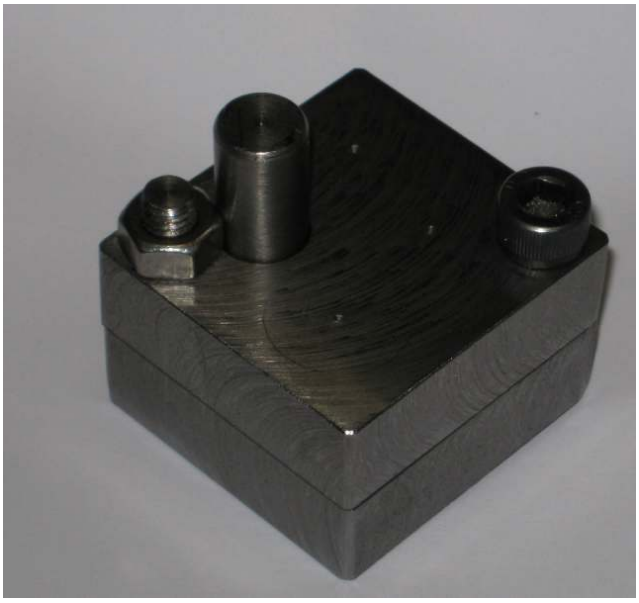
To begin with I just used a sharp knife to cut the paper gaskets for my small steam engines, and soon found that I needed a better method. I got the idea for this simple gasket punch from a posting Bob made at the Model Engine Maker forum (http://www.modelenginemaker.com/index.php/topic,6812.0.html) about making some tiny washers. He made his die set from aluminium, I used mild steel for the die and high tensile bolts for some of the punches, the other punches were made from some pieces of suitable steel rods I had lying around. Like Bob I didn't harden anything, the punch will be used to punch out paper gaskets for my small steam engines so I guess hardening won't be necessary. Many thanks to Graham Meek for his advice.

Die Plate and Guide Plate

I started with a couple of 12mm thick pieces of black mild steel from my box of scrap, and squared them up in the milling machine, and removed sharp corners. They cleaned up to just over 38 x 40mm. They should have been a little larger but I used what materials I had at hand. This meant that some of the punching holes ended up a bit too close to the holes for the guide pin, I simply made a couple of narrower holes for smaller guide pins and remove one of the 6mm guide pins when needed. The holes for the smaller guide pins were drilled from the bottom and not quite through the guide plate.



The two holes for the two location or guide pins were marked out and the work mounted in the milling vice. I used a toolmakers clamp to make sure the two parts were accurately positioned. I first drilled with a smaller pilot drill and then I used a 5mm drill and drilled straight through both. The hole in the guide plate was drilled slightly under 6mm before reaming. The hole in the die (bottom part) was also drilled slightly under 6mm for a depth of a little over 6mm and reamed with a machine reamer, the rest with the 5mm hole was tapped M6. I decided to use guide pins that are threaded M6 in each end so that I can clamp the two parts together with the paper gasket in between. One of the guide pins can be seen in the photos.



After drilling and reaming the two holes for the guide pins I turned the guide pins from an old high tensile bolt and screwcut the ends M6. I could then clamp the two parts together and mark out the centres for the punching holes. For the smaller hole I just used an ordinary twist drill. The photo shows just the smallest punch hole and one punch.

A drilled hole isn't perfectly round so for the large holes I mounted the two parts in the 4-jaw. I first drilled an undersize hole and then bored the hole to dimension, this gave a better result.

Then it was just a matter of adjusting the jaws to bring each punch mark to the centre line and drill and bore the remaining holes.

Guide pins

I had a high tensile bolt with a for me, non-standard thread and I used that to turn the two guide pins.

I just mounted the bolt in the 3-jaw and faced the end and centre drilled so I could support the end with a centre.

After turning to a sliding fit in the 6mm hole in the guide plate the end supported by the centre was turned about 0.1mm under size and the M6 thread screw cut. This end will enter the die plate.

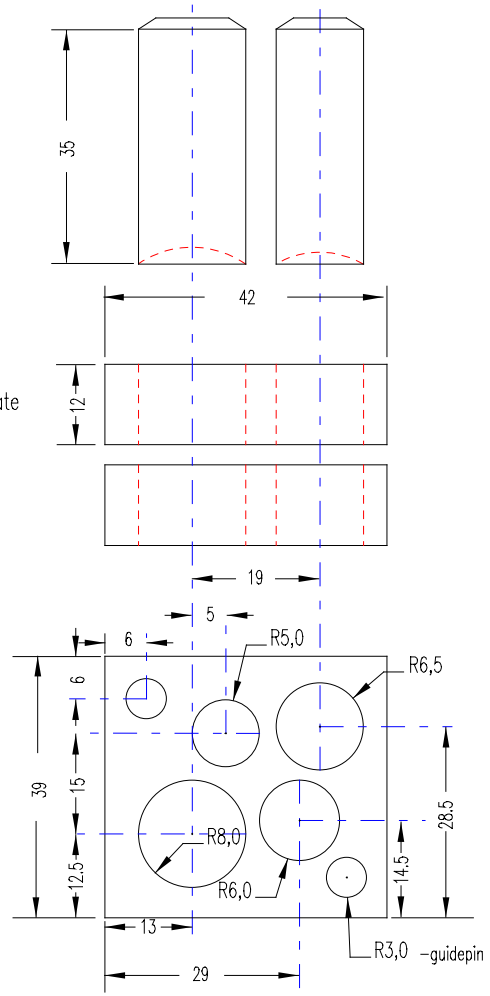
The centre was retracted and the work was parted off, turned around in the 3-jaw and the parted off end was faced and turned slightly undersize and screw cut.

Punches

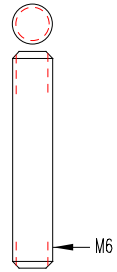
I had a couple of high tensile bolts that I used to make the 10mm and 13mm punches, for the 12mm and 16mm I found some suitable off cuts in my scrap box, I just had to face on end and chamfer the other.

The photo shows the finished gasket punch with a piece of cardboard with some test holes. The gasket punch worked well.

Punches with hollow end



Guidepin (2 off)



Only two punches shown

Only two largest holes shown

Holes for guidepins not shown

TH	2017	Measurements in mm	
Gasket Punch for hole dia. 16, 13, 12 & 10mm			
Material: Mild Steel, Punches C45			