From: **The Home Shop Machinist** Editor@HomeShopMachinist.net
Subject: Milling a Taper in Thin Steel
Date: 23 December 2015 at 2:14 AM
To: jviggers@iinet.net.au

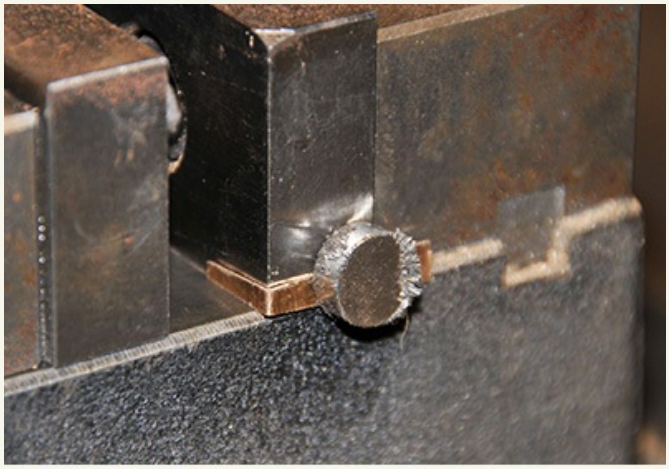
THE HOME SHOP Machinist

Milling a Taper in Thin Steel

By John Viggers

I needed to mill a 1.5° taper in a 2 mm thick piece of steel for part of a steam engine. There are probably other and better ways of achieving this, but this is the method which I devised.

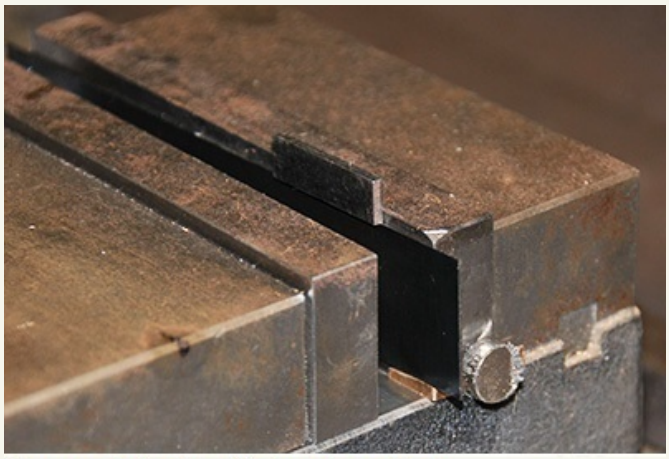
The workpiece was machined to the correct thickness, and a bit oversize in width and length. It was then clamped in a milling vise, resting on an ultra-thin parallel, which was tilted at exactly 1.5°. How to achieve exactly 1.5°?


The brass spacer.

The vise measured 130 mm wide, and the parallel is slightly longer. Using basic trig (height = 130 x tan(1.5°)) I calculated the one end of the parallel needed to be raised 3.4 mm. The difficult step is raising one end of the parallel 3.4 mm, and repeating that step for the various pins in the steam engine. Gauge blocks would not work because they are too thick. I needed a piece of metal thinner than 2 mm thick, and

needed a piece of metal thinner than 2 mm thick, and exactly 3.4 mm high, and able to be positioned exactly at the edge of my milling vise.

Here is how I made my spacer: Using a 1 mm thick brass strip, I used tin snips to cut it about 50 mm long, tapering from about 5 mm wide at one end to 2 mm at the other. Using calipers, the point where it measured 3.4 mm was marked and the strip bent at a right angle at that point.


The parallel and workpiece in position.

The bent brass was held in position in the vise with a magnet. The parallel rests on the vise base at one end and on the brass strip at the other. Voila! Exactly a 1.5° slope.

Have a tip of your own with photos? **Click Here to Send Them In!**