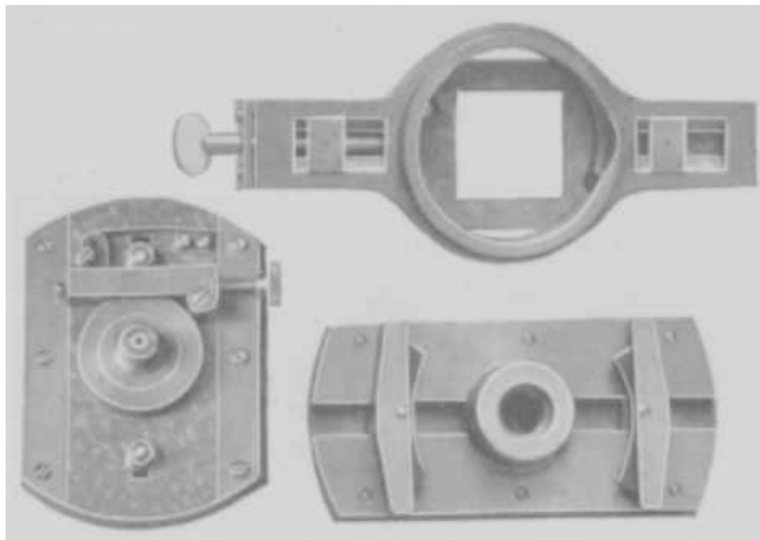


5. ***Circular Work***

Ellipses or Ovals

The Elliptical or Oval Chuck allows us to squash the circle into an oval. This analogy to simplifies what happens when the oval cam is moved into an eccentric position with the pallets engaged.

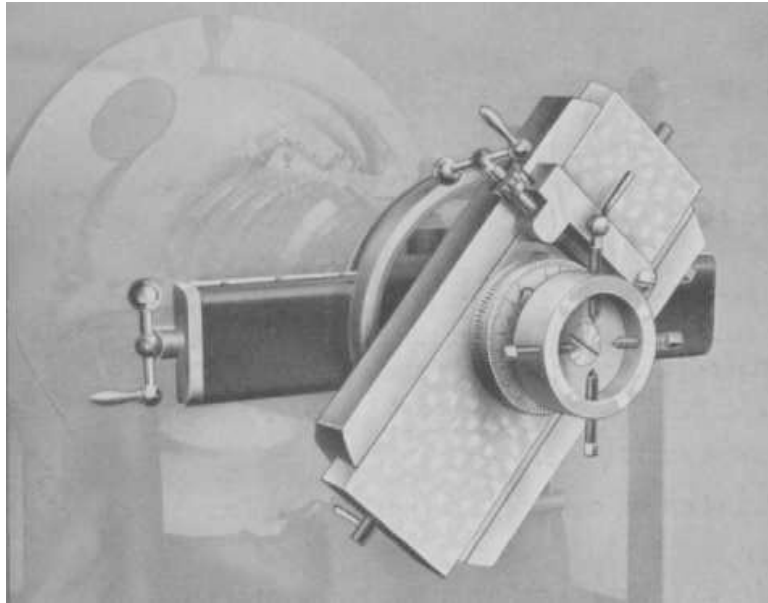
It is useful firstly to look at how this works to understand the geometry. When the chuck is assembled on the machine, this is not very obvious, so the components are illustrated separately to begin with.



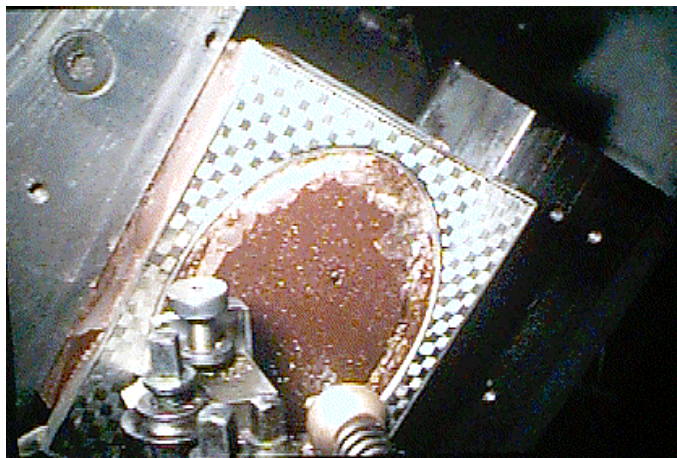
The Components of the elliptical Chuck Top: Oval Cam Bottom Left: The front of the chuck itself, showing it's single eccentric slide Bottom Right: The back of the oval chuck showing the pallets which clasp and slide around the cam This example was made Circa 1925 by R Güdel Ltd, Beinne, Switzerland

The oval cam is normally fixed to the headstock of the machine, concentric to the machine spindle nose on which is screwed the chuck itself. The pallets clasp the oval cam and when it is moved away from the concentric position, they cause the single eccentric slide of the chuck to move back and forth twice each revolution, this "squashes" the circle into an elliptical shape by the amount that the cam is out of centre with the machine spindle.

So the difference between the long and short diameter of an oval is twice the eccentricity of the oval cam from the spindle.



An oval Chuck, this example made by Leinhard & Co, as assembled on a rose engine This specimen has a primitive centring device on the oval slide in addition to the usual nose wheel and worm Most modern oval chucks are compound with double eccentric slides



A handmade picture frame having the final oval trim line cut around the sight hole This is a typical use for oval work It is less usual for the entire pattern to be cut using the oval



An oval "Moulding" for a picture frame, made by using a series of shaped profile tools This was a gilding metal master pattern for casting from which the inside and outside were to be pierced away leaving just the moulding to be cast as a bezel to fit a frame

It is important to realize that many of the rule of thumb methods that people use to make ovals don't create a true ellipse. When making articles that will be oval on the outer or inner edge, it is essential that a true ellipse be produced. It can often be helpful for a client to ask to mark out a template, giving the long and short diameters as the parameters. Another option can be to leave the article oversized or the hole undersized and trim it to our ellipse afterwards.