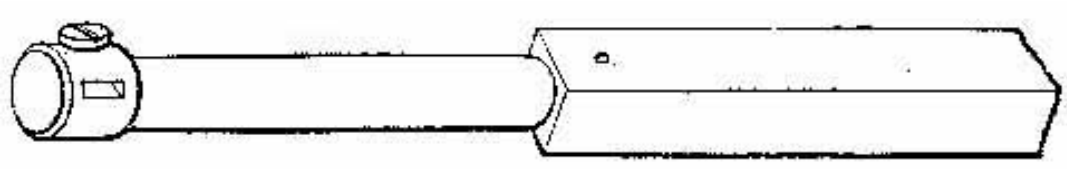
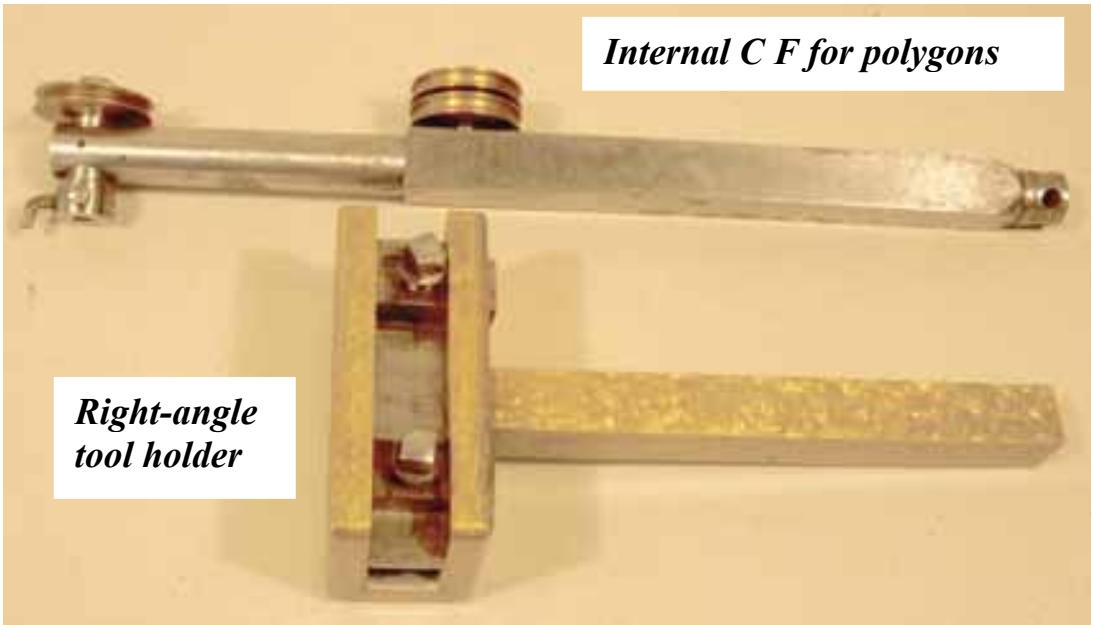
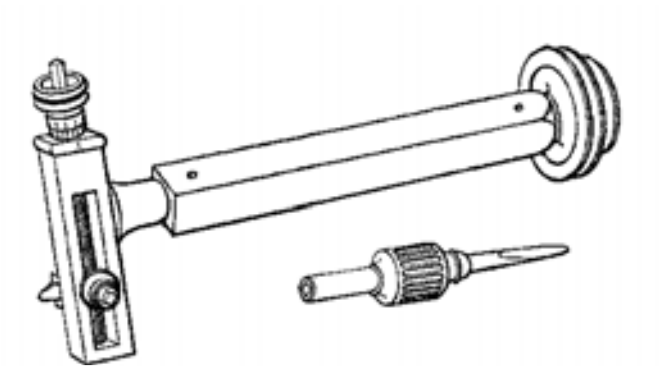
The Internal Cutting Frame has the cutter head on an extended shaft so that it may enter deep into the work.



These have various purposes: for cleaning into internal corners, under-cutting or piercing through from the inside; some are used for cutting the internal sides of polygons. They are sometimes used in conjunction with cranked cutters. The right-angle tool-holder is useful for deep cutting and boring as it may be advanced by the long leadscrew of the slide-rest instead of the short guide screw of the tool-slide.





Eccentric Cutting Frame

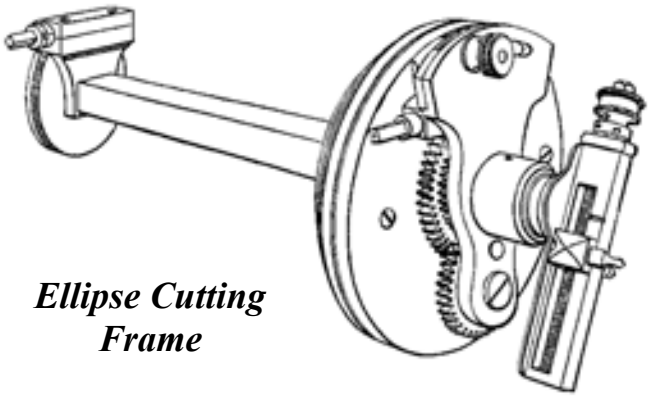
The Eccentric Cutting Frame is similar to a boring head, having a cutter box that can be set to drill a hole on centre or set eccentrically cut a circular groove of any radius within its range. It is used with a single point cutter for individual plunge cuts or continuous swathe cuts. A plunge cut gives a circular indentation with a radius equal to the eccentricity of the instrument, which is adjustable from zero to 1½ inches or more. Using a point tool; a series of cuts may be taken at regular intervals around the work to form a variety of patterns such as the barleycorn, the turk's head and others; or, by adjusting the radius of the cutter by regular intervals, shell patterns may be formed. Using a round-nosed cutter the tool may be used to take planing cuts to form facets or hemispheres.

The lid of this African Blackwood box was cut with the Eccentric Cutting Frame; the background pattern comprises series of 5 shallow cuts made with one space intervening. The centre pattern was cut deeper by double

counting with the Eccentric Chuck.

The top of this pepper mill was cut with the Eccentric Cutting Frame at an angle of about 45°to the lathe axis.

The Ellipse Cutting Frame is like an Eccentric C/F but with two eccentricities and a 2:1 gear ratio between them so that when rotated, the cutter follows an elliptical instead of a circular path. The radius of the cutting head is adjusted to half the required minor axis of the ellipse to be cut. The spindle of the cutting head rotates within a socket on a flange; fixed to the back of this short spindle is a 36-tooth gear meshed with another 36-tooth gear combined with a 24-tooth gear meshed with a 48-tooth gear. The 36/24-tooth combination is on the pivot point of the flange and the 48-tooth gear is fixed to the main spindle which passes through the large pulley. When the large pulley is rotated the whole of the apparatus rotates around the 48-tooth gear but as the ratio of the gearing is 2:1 the cutting head rotates at twice the speed of the pulley and in the opposite direction. The flange plate may be released and moved in an arc around the pivot point so that the socket becomes eccentric to the axis of the main spindle; this eccentricity equals half the difference between the minor and major axes of the ellipse to be cut. Alterations to the eccentricity of the flange plate, being in an arc, not a straight line, change the plane of the subsequent ellipses so, to keep a series of ellipses on a common plane, it is necessary to compensate for the flange angle; this is done by rotating the main spindle by an equal change of angle using the worm and wheel adjustment at the back end of the main spindle.



Ellipse Cutting Frame

The pattern on this dome-top box was cut with the Ellipse Cutting Frame and comprises a series of ellipses in a 3-looped rolling circle achieved by double counting with the Eccentric Chuck.

The four-leaf clover pattern cut in this flat-top box was made with the Ellipse Cutting Frame with substitute gears so that the motion produced a four-lobed cut instead of an ellipse.