CENTRES and TAPERS

GEOMETER tells how to achieve accuracy of work between centres

THE ACCURACY OF WORK machined between centres on a lathe depends in large measure on truth and alignment-of the centres. If 'the live centre is not running truly the work will be machined eccentrically? and if the centres are out of alignment the work will reveal a similar divergence from truth-usually as taper where parallelism is desired.

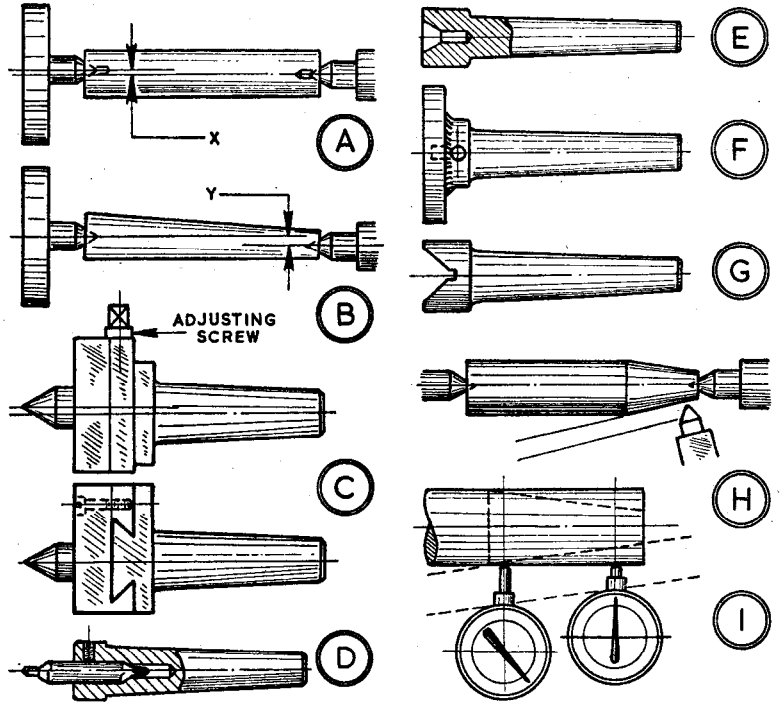
On a dead-centre lathe, or between-centre-grinder, both centres are stationary and the work is automatically concentric about the centres on which it revolves. On a lathe, however, where the spindle centre is running, truth at this point is important. Should this centre wobble ***A*** to the extent X, the work will be circular but eccentric; and with the work reversed on to the tailstock centre the wobble becomes evident.

This can be guarded against by grinding the angle of the centre with it running in the spindle, then fitting in the original position; or a soft centre can be used here-good quality mild steel or cast steel-and lightly machined before use when necessary. As there is no movement of the work on this centre it neither wears nor needs oiling.

Tapering work ***B*** occurs as a result of the centres being out of alignment with the main guideways of the bed, usually because of inaccuracy of the tailstock setting Y. This may be overcome by truing or setting over the tailstock, taking light cuts on the work to test' the effect and ensure parallelism before' the work reaches finished size.

In this connection it is not unusual for inaccuracy to be more marked at certain extensions of the tailstock barrel, or to vary with the degree of force used in clamping the barrel in the tailstock. Moving the tailstock on the bed can also affect alignment and call for re-truing the setting.

For such cases-occurring mostly on older type or worn lathes-an adjustable centre, C, is invaluable. This incorporates a small slide and adjusting screw by means of which the centre can be regulated sideways independent of the tailstock. Very slow tapers can be machined with the centre (or tailstock) deliberately set over.



A centre drill for use from the tailstock can be mounted in a holder D. Mild steel is turned taper on the outside to fit in the lathe spindle, then centred with a pointed tool and drilled from the tailstock to take the centre drill tightly-a grubscrew being used for holding. In the absence of other means of extraction flats can be filed on the holder to turn it with a spanner.

A hollow centre ***E*** can be similarly made. Such a centre is useful for drilling in a lathe when for any reason the drill cannot be held in the tailstock chuck. Instead a carrier is fixed on the drill to prevent it from turning. The drill is then held by the carrier, shank end into the hollow centre, and the cutting end applied to the work revolving in the chuck-feed being put on by the tailstock.

Except when drills are small speed should not be too high; and if there is any possibility of the drill becoming unmanageable, the leg of the carrier should be supported on the slide rest, or a piece of tubing should be slipped over it to maintain a better hold.

A flat or pad centre ***F*** can be made from a shank brazed or welded into a mild-steel disc. Then the shank is fitted in the spindle and the front of the disc faced true. This centre can be used for squaring work endwise in the chuck or for drilling flat material with the drill running in the chuck. A V-centre G can be used for cross-drilling round material.

For machining tapers the topslide is set over H for the tool to move parallel to the taper. On parallel material I, using an indicator and knowing the taper per inch in thou, a setting can be obtained by feeding the topslide 1 in. for the variation in reading to be seen. ❑