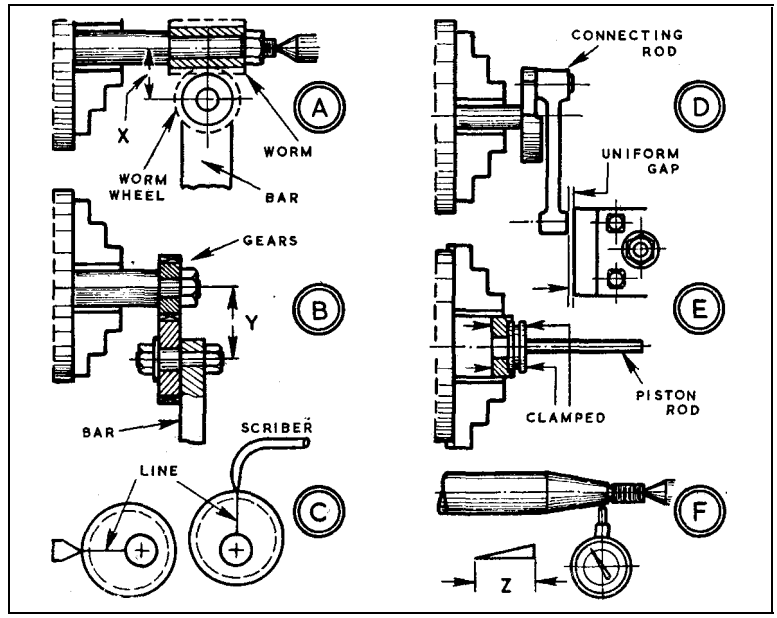
TESTING COMPONENTS on the lathe

IN a large toolroom or inspection department, tools for marking off and testing components-vee-blocks, surface-gauges, squares, angle plates-are often supplemented by items of special equipment, such as bench centres, dividing heads, angle measuring equipment and gear testers. In addition, jigs and fixtures are made to requirements when the testing of repetition parts can thereby be more easily and speedily performed.

By GEOMETER



Often, of course, special' equip ment functions on a straightforward principle, which a lathe, with a little preparation, can duplicate for the amateur or machinist with limited resources. Its centres, chucks, face-plate, slides, are there ready to use-with feedscrews for setting, or even simple measuring.

One standard item is suggested for extending the scope of work-a platform for the bed, which can be a suitable small surface plate, steel plate surface ground each side to be flat and parallel, or a piece of plate glass. On any of these, a surface gauge or square can be used better than on the bed itself. A surface gauge with an extended base (as described in the previous article) can he used similarly-and if its base is flat and parallel, a square can be stood on it for vertical testing or scribing.

Gears especially can be tested and run-in on the lathe before assembly; and departing a little from theory, if necessary, there can be the practical effect of much-improved runmng. In theory, pitch circles and centres are according to the dimensions on the drawing. In practice, for the one-off job particularly, it may not be so. Then sweeter running of gears, with binding eliminated and backlash at the minimum, can result from running them in on the lathe, using an abrasive like metal polish, measuring ***their*** working centres, and using these dimensions on the job. No other dimension must, of course, be involved; and if one is dealing with bores already produced, and now to be bushed, the bushes can be made appropriately eccentric and pegged when fitted.

A worm and wheel ***A are*** run-in with the worm on a mandrel in the chuck, the wheel on a spindle in a bar on the slide. The best centre distance X is obtained and then, without altering the slide, worm and wheel are removed, and a check is made by micrometer over the mandrel and spindle. A pair of spur gears ***B can*** be similarly run, one on a mandrel, the other on a spindle; centre distance Y is then checked.

Testing the maximum throw of an eccentric and marking its position are jobs effectively done on a lathe, using either a surface gauge and square, or a vee tool at centre height on the slide C. The eccentric is on a stub mandrel, whose centre is found from cross lines. After the surface gauge scriber has set maximum height, a vertical line (right) is scribed, using the square. Alternatively, a lme can be scribed with the vee tool after you have set the maximum throw horizontally (left.

A connecting rod can be tested for parallelism mounted by its big-end on a mandrel, with another through its small end to verify by surface gauge. Tests can also be made on crankshafts, and a very searching one can be made of crankpin alignment with the connecting rod fitted D. A straight-edged plate is set on the slide at centre height,. its edge at right-angles to the lathe axis. If the crankpin is parallel with the main-shaft, the gap is uniform at each end of the stroke.

The piston rod cover and gland of a steam cylinder can be checked by facing a thick washer in the chuck, boring for the spigot, and clamping up the cover and fitting a piston rod. Wobble on this indicates a source of binding. A truly-faced piston and rod may be tested in a simlar manner ***E.***

When a dial indicator is available, a taper on a shaft or tool can be very accurately tested, mounting the shaft in the chuck or between centres, and the indicator at centre height ***F. The slide*** is set for parallel turning and moved a definite distance Z, preferably 1 in. Then the difference in reading of the indicator is the tangent of the angle in the tables. El