Centre turning at speed

By GEOMETER

EVERY lathe works best on the job which is the average for its capacity-although this is an ideal not long sustained in practice. In the small workshop especially, the lathe must operate over its full capacity, dealing with large jobs which are turned with back gear on the faceplate, and small ones which are rotated at top speed between centres.

With small jobs which can be run between centres, the difficulties caused by lack of speed in a modelling lathe can be overcome by special equipment, and the speed of rotation be increased to that which is attained on instrument and clock-making lathes. This is a great help if there is a good deal of small-size turning to be done, as distinct from the occasional very small job which can be accomplished with extra care.

Owing to on unfortunate printing transposition the drawing of this article was published last week. This week's drawing should be considered in relation to the text printed on February 22. The two articles relate to each other.

For turning work between centres, it is not necessary for either centre to revolve. This is exemplified in the watchmaker's turns and in certain types of grinder on which only a driving plate revolves, with the work rotating on two dead centres. In some instances the work-mounting centres are hollow, so that pointed spindles can be located.

A basic design of special centre, with driver, is as at A. Its dimensions can easily be made to suit any lathe; and with a tiny centre in the tailstock, one is ready to begin on very small Jobs. Going further, a small slide can be made to replace the turret; then one has, in effect, an instrument lathe.

The centre holder can be in mild steel, fitted in the taper in the lathe spindle, as shown. At the front end, there is a hardened and tempered silver steel centre with parallel shank from standard rod. The bore for this centre can be reamed or carefully machined, with a grubscrew to hold the centre. To be certain that it cannot push back in use, keep the centre up with a stepped plug and a screw: the remaining thread at the rear of the centre holder may be used sometimes for a draw-bolt. The driver, in the form of a light-alloy pulley with a screwed-in and lock-nutted pin, is mounted by an interference fit on a small ball race, which, in turn, is mounted by an interference fit on the front of the centre holder.

Obviously, all the parts are easy to make. The centre holder and spindle should be marked with references for fitting. A draw-bolt provides for fitting and removal without damage. The bore for the centre should be machined and reamed with the holder in the lathe spindle. Shoulder the centre for tapping in with a tube-not damaging the point; the stepped plug enables it to be tapped out again. The fine point should be finished with the lathe running at top speed.

Drive to the pulley can be by belt from a large pulley on the shaft of a small electric motor, or on a mandrel in the chuck of an electric drill. Either can be mounted on a bracket at the back of the lathe, and will provide all the speed needed-say, 3,000 r.p.m. through suitable pulleys.

Alternatively, the lathe can provide the drive through a countershaft. For this, the lathe driving plate is grooved for a belt as at B, and the countershaft is made, as at C, to mount on a bracket at the back of the lathe. The twin pulley can be a casting in light-alloy uith pressed-in ball races. These should be spaced by a distance piece, and protected from dirt with stepped washers WX. Two further distance pieces YZ abut to the arms of the bracket; the spindle is fitted with a nut each end.

A centre-mounting device, the same in principle as that at A, can be made to mount in the independent chuck, as at D, with drive to the countershaft from a large single pulley. The centre can be adjusted true from the chuck; or if a hollow centre is used, for a pointed-spindle job, it can be clocked true.