

# DIVIDING IN THE LATHE

L. C. Mason describes an additional, compound dividing bracket for the simple lathe attachment described in the January 16 issue

COMPOUND DIVIDING, using the lathe's change wheels as dividing plates, very greatly extends the range of numbers into which it is possible to divide. For example, it is easy enough to divide in one stage to give 8 divisions, but any other multiple of 8 (other than 40) using the standard wheels is not possible.

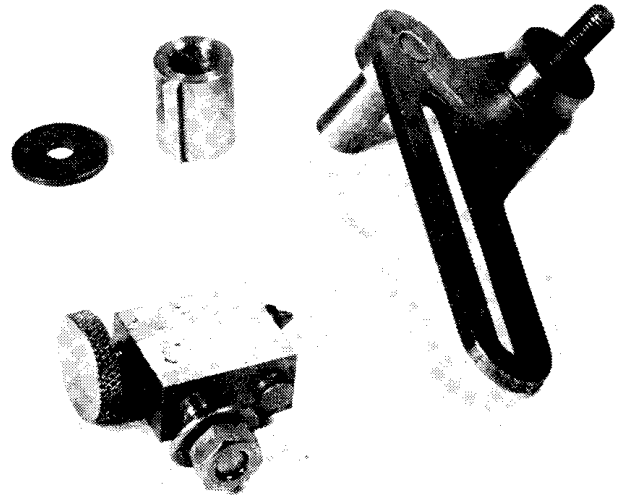
With the compound attachment, it is equally simple to divide into 16, 24 or 32. Scores of other numbers are equally easy, such as 39, 56, 18, 42, or some of the "awkward" numbers sometimes required for gear cutting by clockmakers.

The procedure is to select a change wheel that can provide a factor of the number required, then attain that number by gearing down by means of an additional pair of gears.

Taking 18 quoted above as an example, 9 is available from the 45 wheel by indexing round every 5. All that is needed from there is to index round the 45 wheel for 9 positions, but to gear the 45 wheel down to the mandrel by 2 : 1 with say, a 40 and 20 pair of wheels. The 40 wheel goes on the mandrel extension, driven by the 20 wheel to which is keyed the 45 wheel. On indexing round the 45 wheel, the resulting 9 positions will only have turned the mandrel half a turn, because of the 2 : 1 gearing, so a second turn round the 45 wheel is required to move the mandrel one complete turn, providing a second set of 9 positions. Thus the two turns of the indexing wheel provide 18 points around the one turn of the mandrel.

As a further example, 28 can be obtained by way of indexing round the 70 wheel by 5's to give 14, and gearing down in the same way by 2 : 1 to give a final 28. Should 56 be needed, both this and 35 have common factors of 7. Dividing both by 7, the ratio between them is seen to be 8 : 5. Therefore by indexing round every tooth of the 35 and gearing down 8 : 5 by the 40 and 25 wheels, the result is the required 56 divisions.

The easiest way of bringing a second pair of wheels into action is to provide a bracket to carry them, adjustable as to position so that various sizes can be meshed with a wheel on the mandrel. On the extra bracket, too, will have to be mounted the detent block to engage the outer wheel of the extra pair. All that is required, therefore, is a simple



*Parts of the compound dividing gear.*

plate equipped with a slot the same as the original bracket to carry the detent block, a stud on which can be mounted a sleeve for a pair of change wheels, and a fixed mounting stud by which the whole can be attached to the basic bracket in such a position that the extra wheels can be meshed with the mandrel wheel.

The photographs and drawings show this to be quite a simple affair, filed up from  $\frac{1}{8}$  in. steel plate, with two studs either riveted or silver soldered in position. The mounting stud goes in the detent block slot of the original bracket, utilising the adjustment provided by the slot for adjusting the mesh of various sized gears. The stud at its attachment point with the bracket incorporates a larger diameter collar, the thickness of which serves to line up mandrel gear and driving gear. This stud also clamps the top end of the stay rod as did the detent block stud in the simple version. The detent block is naturally transferred to the similar slot in the extra bracket.

A sleeve to carry the extra pair of gears keyed together can be made up for the job, rather than disturbing a change wheel train already set up on the lathe quadrant to borrow a sleeve from the lathe's own set. The drawing shows the dimensions,