

CHAPTER 10

The Lathe as Shaping Machine

There are sometimes small jobs of a character akin to shaping that might with advantage be carried out with the work still mounted in the lathe. The cutting of an internal keyway is an example in point.

This is an operation that may be performed with a suitably shaped tool caught in a boring bar mounted on the lathe top-slide. The tool is set on the centre line of the lathe and *pulled* through the work by moving the saddle along the lathe bed, the depth of cut being controlled by the cross-slide feed screw. The process is analogous to the treatment already described when dealing with the cutting of keyways in the shaping machine.

The simple set up is depicted in Fig. 1.

The use of the lathe saddle alone limits the operator to keyways parallel with the axis of the lathe. It is therefore better to use the top slide for imparting movement to the cutting tool; in this way keyways on the taper can be formed when needed by simply turning the slide to the desired angle. As before, the cross-slide feed screw controls the depth of cut which in the interests of comfortable working should be limited to some 0.001 to 0.002 in. per stroke

Fig. 1 Simple set up for keyway cutting

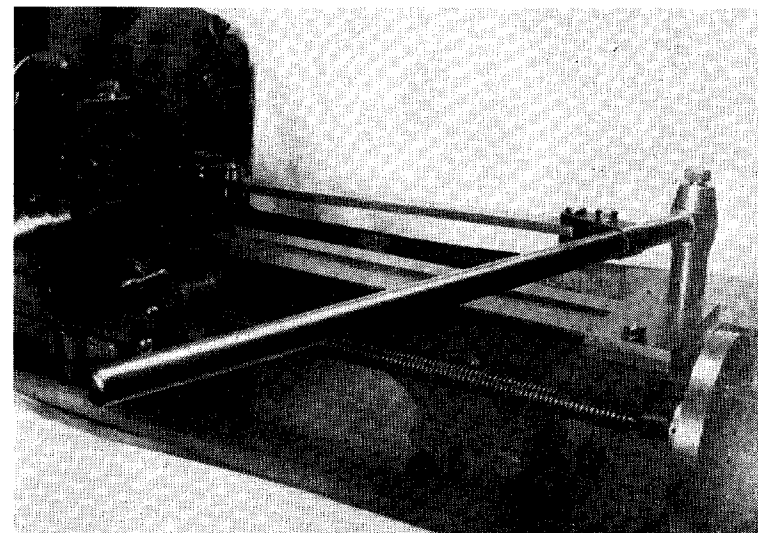
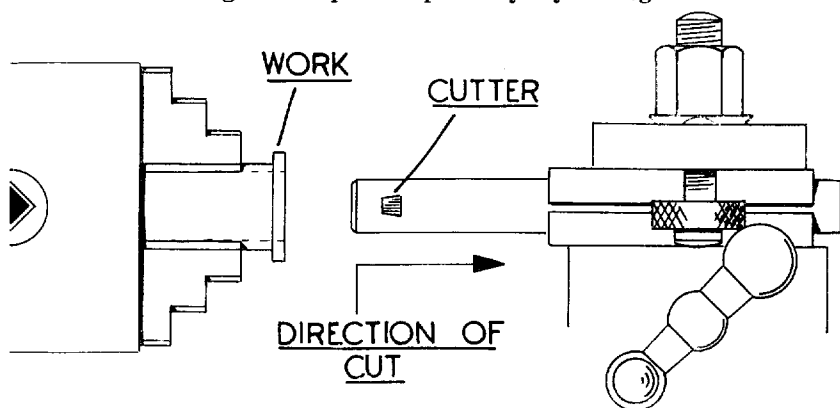
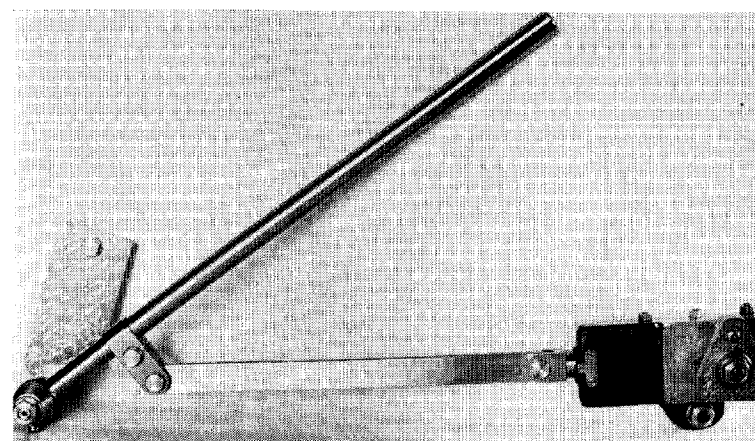


Fig. 2 Shaping equipment fitted to a Winfield Lathe

The equipment illustrated in Fig. 2 was once fitted to a Winfield lathe, the forerunner of the Myford products incidentally, and has since been modified for use on a ML 7 lathe.

The attachment consists of but few parts. These are the fulcrum plate A supporting the operating lever B and a connecting rod C attached to the lever and the top slide by suitable fitments. As

Fig. 3 Parts of the equipment



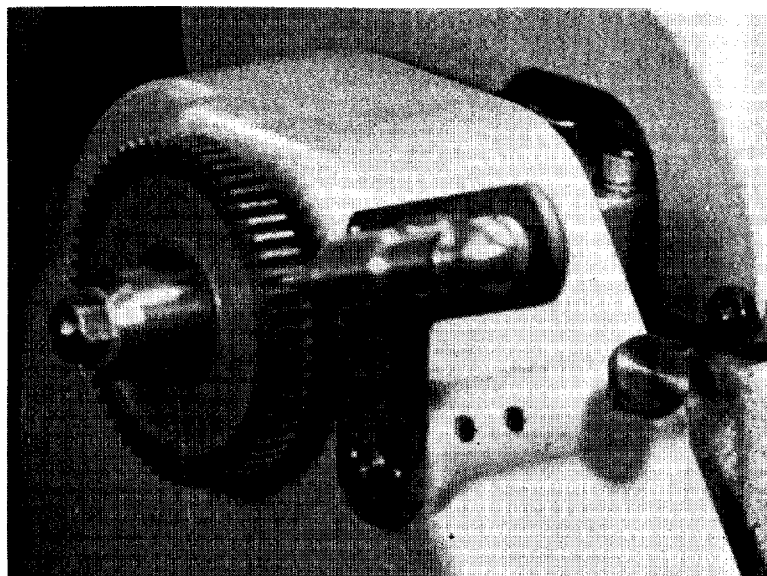


Fig. 4 Change Wheel and Detent Fitted to the ML 10 Lathe

depicted in Fig. 3, the clamp mounted on the lever is adjustable for position and enables both the stroke and the leverage obtainable to be varied at will.

The connection to the top slide is by means of a fork attached to the slide in place of the feed screw, which is, of course, removed when the device is used.

When the top slide is of substantial construction it may be possible to mount improvised fittings that will allow a tool to be secured vertically and fed to the work under controlled conditions. In this

Fig. 4A Details of the Mandrel Extension

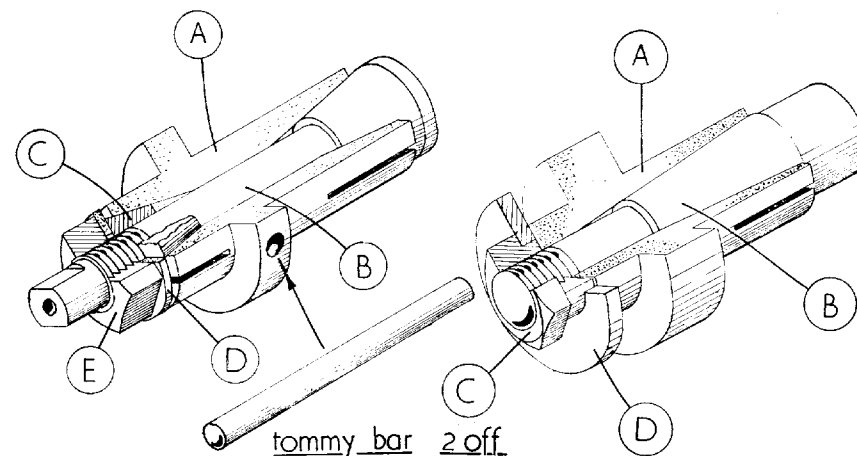
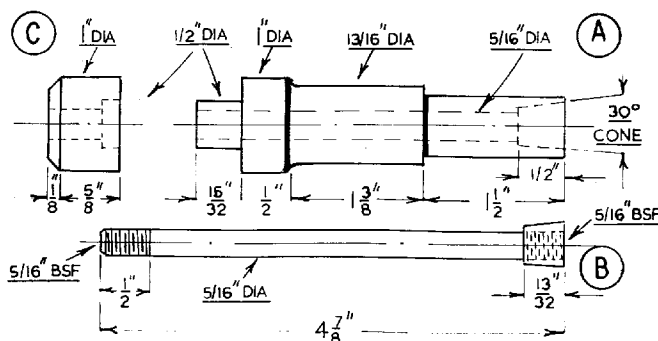


Fig. 4B Alternative forms of Mandrel Extension

way such work as the forming of simple flat surfaces on components, or the squaring of the ends of shafts, can be carried out as required. Such operations of course call for the use of dividing equipment, however, simple, that may be attached to the lathe and the number of divisions required are few. The easiest way to ensure accurate



Fig. 7 Holder for keyway cutting tool

Fig. 5 Shaping equipment fitted to a Drummond Lathe

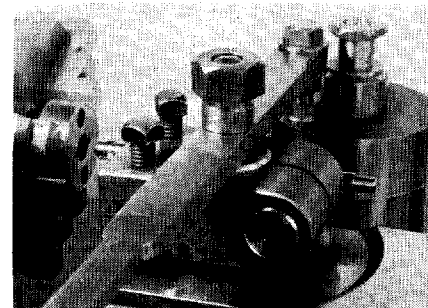
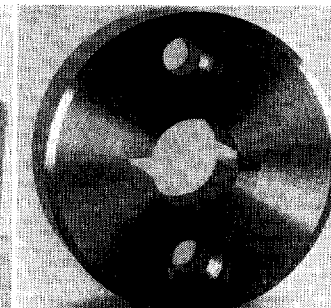


Fig. 6 Component with opposing keyways



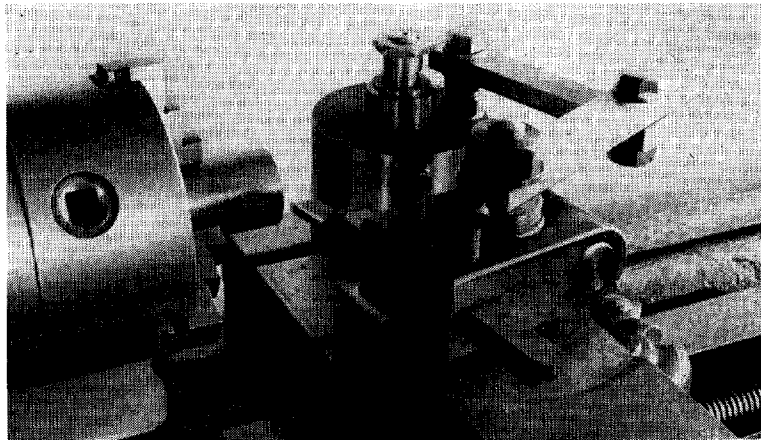
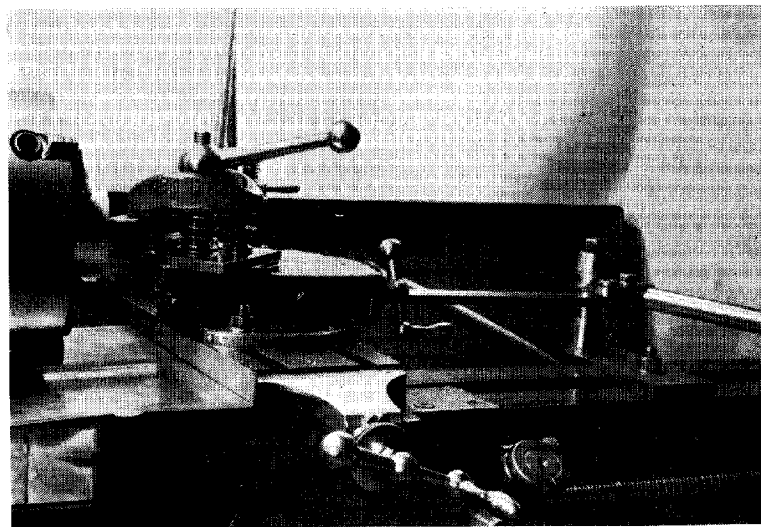


Fig. 8 Machining a transverse slot in the Drummond Lathe

dividing in the lathe is to make use of a change wheel having a number of teeth that can be divided equally by the number of divisions required. As only 2, 4 and possibly 6 divisions are needed, either a 40-tooth or a 60-tooth change wheel will suffice. In practice the change wheel is mounted on an extension to the lathe mandrel itself. A typical arrangement is depicted in the illustration Fig. 4, ML10. Here the change wheel is mounted on an adapter having a

Fig. 9 Set up for cutting a ring gear in the lathe



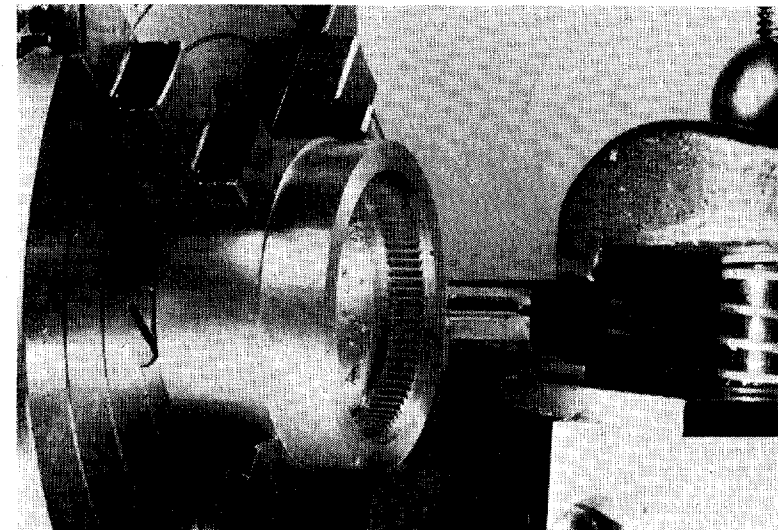
spigot that is made a push fit in the mandrel and is expanded by a tapered bolt that causes the adapter to grip both the bore of the hollow mandrel and the change wheel simultaneously. A detent, attached to the change cover on the lathe, engaged the indexing wheel which is marked off at the correct intervals for the number of divisions required. For example, let us suppose that four separate areas of machining have to be carried out, all at right angles to one another; then, assuming a 40-tooth wheel is being used for indexing, every tenth tooth space will be marked and the detent engaged with each mark in turn as the machining proceeds.

The details of the mandrel extension are given in the drawing Fig. 4A. The particular extension shown is one fitted by the author to the Myford ML10 lathe. However, the information given on the drawing should enable any reader interested to work out for himself any modifications needed to adapt the device to another make of lathe.

An exploded view of a similar mandrel extension is given in the right hand illustration of Fig. 4B. The extension depicted in the upper illustration is a rather more advanced device providing means of expanding the seating for the change wheel as that of the extension adapter as a whole.

An interesting, somewhat improvised, set up applied to a 3½ in. Drummond lathe is illustrated in Fig. 5. The shaping equipment is

Fig. 10 Close-up of the work



depicted machining the opposing keyways in the component seen in Fig. 6. The tool used is mounted in the holder illustrated in Fig. 7 and is of a type referred to earlier in the chapter.

Those readers who know the Drummond lathe well will not need reminding of the essential sturdiness of many of its component parts. This is particularly true of the top slide which is a robust and well engineered unit having in addition, a form of tool clamp, that makes tool height adjustment a simple and rapid procedure. For this reason the Drummond top slide has much versatility, as may be gathered from the illustration Fig. 8.

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