Novices Corner

Using the D-Bit

THE success of using a D-bit is dependent upon the tool being started truly in the work. There is little use in drilling a hole at random and then engaging the bit, for this can hardly be expected to give a successful result.

After the work has been centre-drilled, as illustrated in Fig. I, operation I, a pilot hole is made with a drill some 1/8 in. smaller than finished bore size, operation 2. This hole is next enlarged with a small boring tool to afford a close working fit for the D-bit ; the bore so formed should extend for a depth equal at least to the diameter of the tool itself. Operation 3.

The bit is now mounted in the tailstock drill chuck, preferably with the flat surface downwards, as this helps to free the chips from the cutting edge, and is fed into the work, operation 4. Where a pilot hole has been drilled and but little metal remains for removal, the D-bit will cut quickly and the chips formed are able, in part, to escape along the bore ; but, when machining a blind hole, the bit must be withdrawn at frequent intervals to clear the chips which become imprisoned between the flat surface of the tool and the bore.

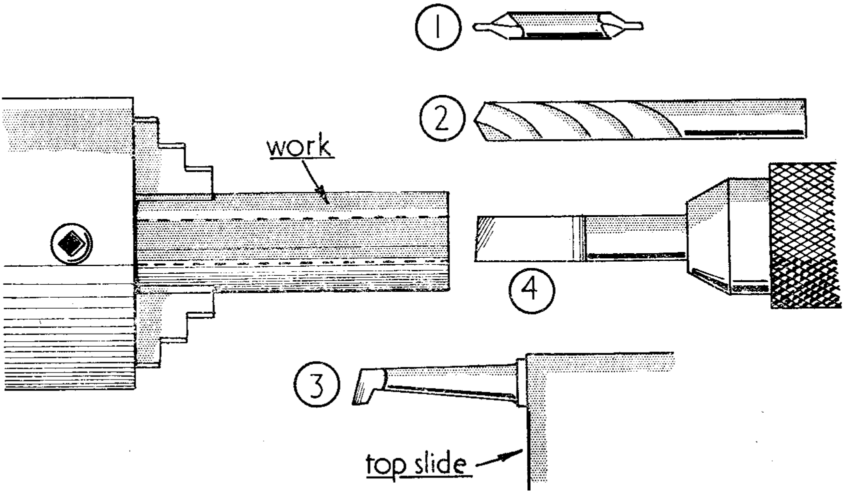

Fig. 1. Sequence of operations when drilling with the D-bit

Lubrication

The bit, after being started truly on its course, in the manner described, will maintain a straight path, and on completion of the work, the bit itself will be a good working fit in the bore formed. Therefore, adequate lubrication of the shank during its passage through the work must be provided. This is particularly important when bronze or similar metals are being machined. When the cutting edge becomes worn, the tool will tend to cut undersize, and insufficient lubrication may then result in the bit jamming in the work.

Since using the D-bit is essentially a drilling operation, the lathe may be run at mandrel speeds suitable for twist drills of the same size. The tool feed should not be hurried, and the bit should be allowed to cut easily. If the tool quivers, or is seen to twist it should be withdrawn at once so that it may be cleared of chips and lubricated before being re-entered in the work.

Rather than use the handwheel when withdrawing the D-bit, it is better to pull back the complete tailstock ; this procedure expedites both the removal and re-engagement of the tool.

Clean Bores

The lathe should be in motion at the time of withdrawal, but should be stationary when the bit is re-engaged with the work. The bore should be cleaned out before the bit is again engaged ; otherwise, any small particles of metal present will cause the shank of the tool to bind in the work, making re-entry difficult as well as spoiling the finish of the bore itself.

Those who have a supply of compressed air available will find this cleaning process is a simple matter. Others, who are not blessed with this facility, will need to wrap a piece of rag round a short length of brass rod and work it in and out of the bore when the lathe is stationary.

Apart from the reason given above there is another which makes it essential to ensure that the bore is clean before the tool is again engaged with the work. If chips are allowed to remain in the bore, in all probability one or more of these will become lodged against the cutting edge of the bit, and the tool will be unable to do its work.

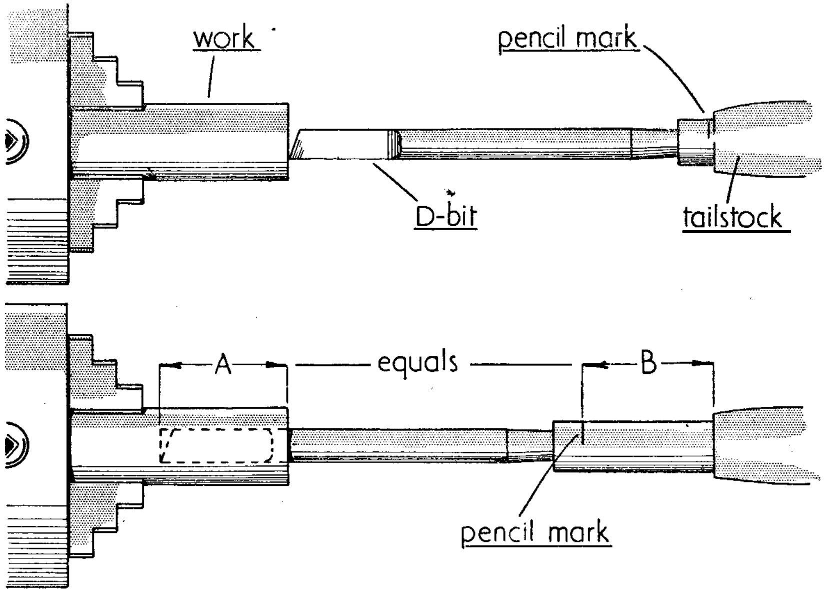

Fig. 2. Determining the progress of the work

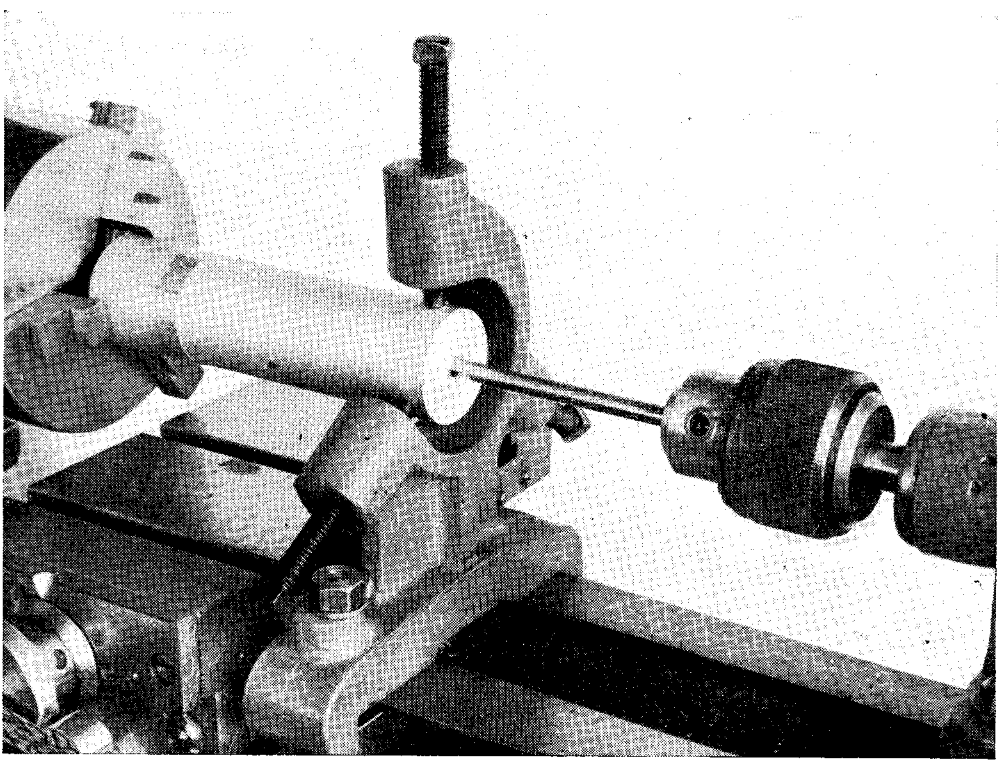

Fig. 3. Using a steady to support the work

This state of affairs will be quite apparent by reason of the resistance to movement which will be felt at the tailstock handwheel. In these circumstances, the tool should not be forced into the work but should be withdrawn so that the obstruction can be cleared.

In order to determine progress, or to bore to an exact depth, the amount of tool feed may be read off from the graduations on the tailstock barrel, where these exist, or by measuring the distance from the face of the tailstock casting to a mark made previously on the tailstock barrel itself. This mark is made when the cutting edge of the D-bit is level with the end of the work, and is shown in Fig. 2, where this method of measuring the depth of the tool's penetration is shown.

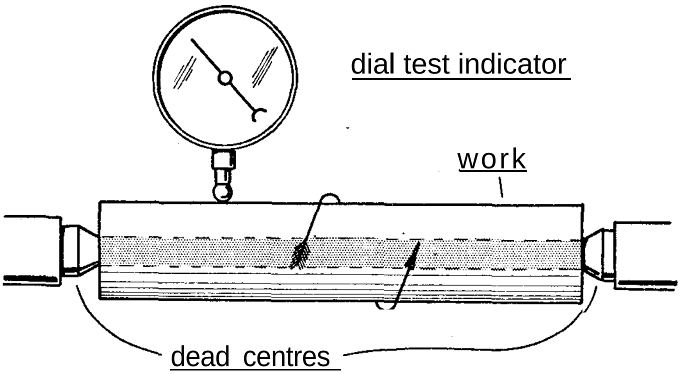

Fig. 4. Checking the work

Marking the required distance with a grease pencil upon the tool itself is hardly practicable, for the cleaning and oiling of the tool shank is more than likely to obliterate any marks made upon it.

Using a Fixed Steady when Boring with the D-bit

If the workpiece is long, a fixed steady should be used to support the work in the manner illustrated in Fig. 3. As will be seen, the surface of the component is first machined so as to provide a true running path for the jaws of the steady. The turning operation must, of course, be carried out using the tailstock as a support, and the work will need to be centre-drilled for this purpose.

Great care must be exercised in engaging the steady with the work ; otherwise the work becomes deflected. The jaws shown in the illustration are hardened steel screws which must be engaged by hand ; it is, then, an easy matter to feel when they have made contact with the workpiece. On no account must a spanner be used, or the sensitivity needed will be lost.

When supporting work in a steady it is sometimes better to use bronze instead of steel jaws to accommodate the particular material of which the work is composed. In this event, it will be necessary to machine a set of close-fitting pads from bronze bar. These pads are then slipped over the ends of the screws and brought to bear on the work in the manner already described.

Testing Finished Work

D-bitting will always form a *straight* hole, and it will also produce an axial one provided that, in the first place, the work has been set to run true by means of a dial test indicator. In many instances, axial truth is not of great importance ; however, when accuracy in this respect is essential, the work should be mounted on dead-centres for checking, a dial test indicator being applied as the work is turned by hand, in the manner shown in Fig. 4. Any errors present will now be revealed. It is advisable to make tests at both ends of the work, so as to determine whether the eccentricity, if any, is uniform or otherwise.

If the degree of error is more than can be accepted, the work 'must be mounted between centres in the lathe, and for preference on a true-running mandrel, so that the external and end surfaces of the component can be machined.

A Motor-Driven Blower

We have examined and tested a small motor-driven centrifugal blower submitted to us by Aero Spares Co., 67-69, Church Street, Edgware Road, N.W.I. This is a very compact unit, the motor being 2-1/2 in. long by 1-5/8 in. dia., the fan casing 2-1/2 in. dia. and the overall length of the unit is 3-3/4 in. It is wound for a voltage of 27.5 V, d.c., though it will run and deliver a fairly efficient blast of air at as low a voltage as 12.

The blower is of the multi-blade type and the casing is a very neat bakelite moulding attached to the motor mounting, which is of light alloy plate. A motor of this type could be adapted to many uses in the model engineering workshop, and it could be run from the mains through a suitable transformer or resistance. One use to which it could readily be adapted is that of a miniature hair-dryer, and if fitted with the usual air heater element, the latter could be utilised as a potential divider to supply current to the motor from the mains, by tapping off a small portion of the resistance to give the required voltage to the motor.