MARKING AND CUTTING

By GEOMETER

It is a truism that material is saved by accurate marking and careful cutting. Although, by observing this principle, extra time may be taken at the first stage, the later operations are always more easily and quickly performed.

In the simple task of cutting a piece of material from a bar, it pays to cut squarely both now and later-and the bigger the bar the greater the benefit. If the cut is made diagonally, there is waste on the piece to be used, and on the end of the bar, to the extent that the line of cut is off-square.

When the off-cut comes to be machined in the lathe, time is needed to true out the wobble before the real facing can begin. The process must be repeated when the next piece is cut off the bar and so the result is that one bad cut wastes time on two occasions.

Flat material and square bars can be marked all round with a square and scriber. Then the hacksaw cut can be watched right through after a square cut. Angle material can be marked on both flanges. Both can be cut on the flat, with the material turned in the vice.

It is advisable to turn tubes several times in the course of cutting-particularly large ones, as this keeps a good length of material under the teeth of the saw, and avoids the stripping which is likely to occur in the middle of a tube when the teeth pass straight across the wall. Large solid round material can be cut all round to a scribed line to prevent the cut from wandering off diagonally.

Two methods can be employed for marking round tubes and bars. One, as at Al, is to use an angle square, which can be a length of faced angle iron. As it is moved round a tube or bar, marks are made where the flanges touch, until there are sufficient to guide the saw. The other method, as at A2, is to wrap a piece of square-edged paper round the tube or bar and scribe carefully at its edge. Alternatively, several dots can be made with a centre punch. You can mark square-ended material with a depth gauge, as shown, in order to cut off a short length.

Making gaskets is another recurrent job which calls for accurate marking and cutting. Its techniques are very different from those employed for metal. The materials are paper, cardboard, fibre and asbestos in sheets of various thickness. All can be cut with scissors, punches and chisels, but not so easily that any method will do-except at the risk of a crack or tear in a thin part of a gasket.

The cutting principles vary with the type of gasket, but it is usual to cut the inside first. Then bolt holes are marked and punched, and finally the outside is trimmed with straight scissors. By another method, bolt holes are made first to locate the material. Then the inside is cut out -a job for curved nail scissors. Finally, the outside is trimmed, the idea being that the waste provides strength to the finish. Only when a washer (trepanning tool) is used for a ring should the outside be cut first, for by cutting the inside the centre is lost.

When a component has a spigot, the hole for it should be cut to locate gasket material, as at ***B,*** while the bolt holes and outside are finger marked for punching and cutting-although all can be done with a ball-ended hammer, even to the hole for the spigot, by carefully tapping round.

Punches can be made from steel rod and tube. With those for holes, an inside chamfer, Cl, avoids the splitting which occurs with fibre washers. Those for outside diameters should have an outside chamfer, C2; they can be located by a steel washer and spigot to punch concentrically.

Diagram ***D*** shows how flat steel can be curved by hammering on a vice, ***WX,*** and then chamfered by filing to make a sectional punch (gouge) for a large radius YZ. Details of an easily-made washer cutter are as at ***E.*** Fl and 2 illustrate straight chisels from flat and round material. ❑