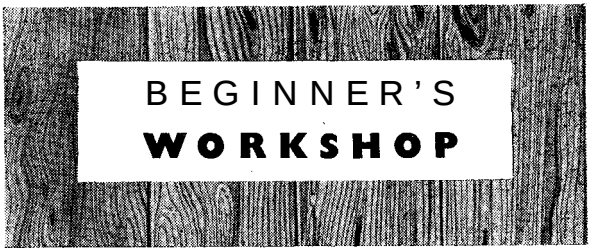
Marking off



GEOMETER explains the procedure for marking work to make neat and accurate cuts in various materials.

IN ORDER TO cut and fit material neatly and position the centres of holes accurately, the essential preliminary is proper marking-off. For most work, the tools required are few, a steel rule for measuring and to serve as a straight-edge; a square for marking right angles; a depth gauge for marking from edges; dividers for describing arcs, circles, and finding centres (or a pencil compass for wood); a centre punch and a hammer for indenting centres, a scriber for metal and a hard pencil for wood.

Wood will mark easily with a pencil, metal needs a scriber if it is slightly rusty or scaly but not hard. If the metal is bright, scribed lines will not show easily and a simple remedy is to rub it with chalk.

Marking centre lines

To cut a piece of wood or metal down the centre, or to position a line of holes, a centre line is made using the depth gauge (Fig. 1). The blade is set to approximately half-distance and a line A made. From the opposite edge, another line ***B*** is made, then the difference split to obtain the line C.

Cross-checking from each edge, the exact centre can be found and the line continued full length, moving depth gauge and scriber together. Alternatively, not readjusting the depth gauge, lines ***A*** and ***B*** can be left for the width of the saw cut.

Straightness check

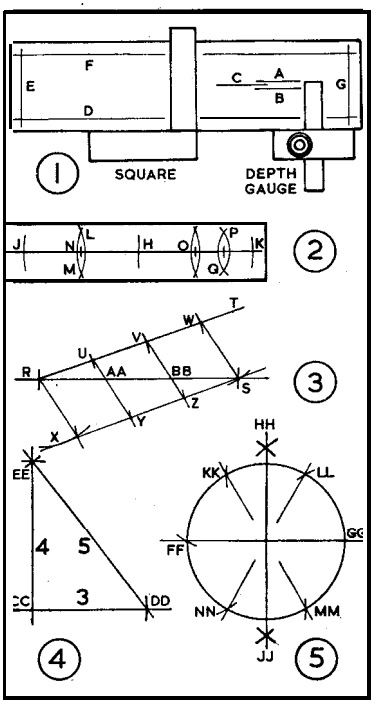
Checking the working edge of material for straightness, the blade of the depth gauge can be set in for marking strips, or to bring the material parallel. The square is used for marking ends or checking their truth. On accurate material, the depth gauge can be set in for marking lines ***D, E, F, G*** at a uniform distance from the edges to the position holes.

Engineers often work from centre lines, taking dimensions or the positions of holes from such. The position H in Fig. 2 on a piece of true material can be obtained with the depth gauge from the ends and sides, and the line ***J-K*** scribed down the centre.

Position ***H*** being centre-punched, dimensions ***H-J, H-K,*** are marked with dividers, taking from a steel rule, centring one leg at ***H,*** and describing arcs at ***J*** and ***K.***

When these positions have been centre-punched, the dividers can be closed to describe arc L from centre ***J,*** and arc M from centre ***H.*** Using the square at the intersections of these arcs, centre N is obtained, the mid-position. Centre 0 is obtained similarly.

Using this centre and closing the dividers, arc ***P*** can be described, followed by arc Q from centre ***K*** and, again using the square, the mid-posrtion is found between 0 and K.



The five methods of marking materials explained in the text

Dividing a line

When the number of holes does not permit bisecting on this principle, another method can be used to obtain the setting for dividers for marking off the centres-though it may be necessary to use a piece. of waste material.

Referring to Fig. 3, a line is marked using the rule, and the overall dimension ***R-S*** marked. Another line ***R-T*** is run at an angle, and the dividers are used to step off positions U, ***V, W*** -the last being joined to S. With the dividers set to dimension ***W-S,*** and using centre ***R,*** an arc X is made and then joined by a straight line to S. With the dividers reset to dimension ***R-U,*** and beginning at S, dimensions Z and Y are stepped off. Joining U-Y, ***V-Z,*** centres ***AA*** and ***BB*** are found. The dividers can be set to dimensions ***R-AA,*** and this transferred to the work.

Fig. 3 shows a line divided into three, but the principle is applicable to any reasonable number of spaces.

Obtaining angles

A right angle (Fig. 4) can be marked from a line ***CC-DD,*** using the principles three, four and five. With dividers set to three units, centre ***DD*** is marked from CC, and from this position also, dividers set to four units, an arc is made at ***EE.*** Using centre ***DD,*** an arc of five units is made crossing at ***EE.*** Thus, the intersection of arcs at ***EE*** forms the right angle.

Dividing into 12 parts

Using centres ***FF*** and GG diametrically opposite on the circumference of a circle (Fig. 5) arcs ***H H*** and ***JJ*** can be made and when joined will run a line at right angles. With the dividers set at the radius of the circle, and starting at ***FF*** or GC, positions KK, ***LL, MM,, NN*** can be stepped off round the dividing the circle into six. Consequently, bisecting as required, a circle can easily be divided into 2, 3, 4, 6, 8 or 12 parts. ❑