MARKING'-OFF and CENTRING

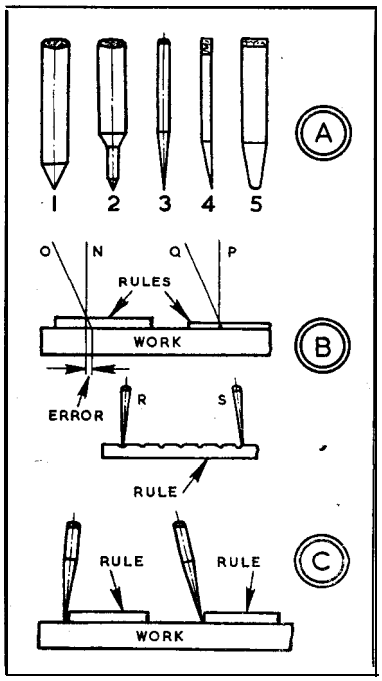
JUST as a good drawing calls for careful draughtsmanship, so does accuracy in a variety of finished products demand skill in marking-off and centring. Many similarities occur in the processes, in basic geometry and in handling tools and instruments, in which lack of care or skill inevitably leads to errors.

First considerations are sharp precise points on scribers, dividers and centre punches, so that lines will be thin and clear, and centres truly positioned.

Using silver steel rod 1/4 in. dia. and about 4 in. long, a centre punch for general work can be parallel on the shank, as at A (1), but one for model work (2) can be reduced to about 1/8 in. at the end to facilitate location on lines and intersections. The smaller diameter also speeds and simplifies resharpening to the fine point which is necessary if the punch is to hold where positioned until it can be tapped with the hammer. On both punches, included angles of points can be about 60 deg.

On a scriber, which can be from 1/8in. or 5/32 in. silver steel rod, the point must be long and fine, as at A (3). To avoid breakage, it should be used at moderate, pressure; and where conditions demand considerable force for scribing, a blade-type tool, as at (4) and (5), is preferable. It can be from flat-stock, chamfered one side, tapered, and with a small radius at the edge.

Centre punches and scribers in silver steel should be hardened and tempered to straw colour, and care exercised in resharpening (by grinding) not to draw the temper. Ultimate sharpness at the points can be obtained by hand honing.



By GEOMETER

Given accurate points, it yet remains for them to be precisely placed on work if small dimensional errors are not to occur-as in reading rules, locating divider points, using scribers.

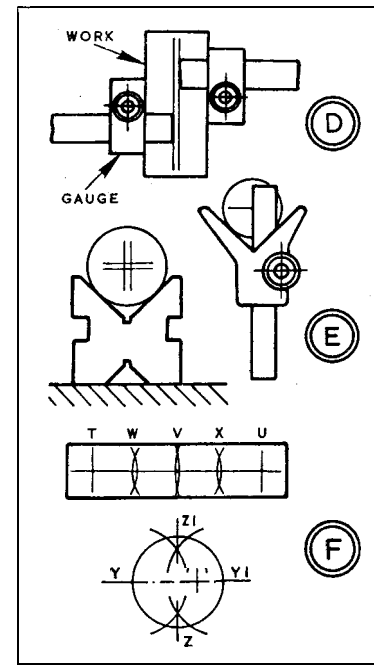
For small work, a thin flexible 6 in. rule is to be preferred to a thicker and stiffer 12in. one. It is easier to manipulate, and any error from parallax is considerably reduced. This follows as at ***B.*** With a thick rule and the graduation on vertical line ***N,*** a side view line 0 leads to an error at the work. It is much reduced, however, with a thin rule, with vertical line ***P*** and side view Q. Naturally, a vertical view eliminates such error, but the advantages are still with the smaller rule.

Locating dividers

In locating divider points, one can be placed in a graduation and the other adjusted to the required dimension. If the located point, ***R,*** is then raised while light pressure is kept on the second, S, it feels solid if properly located. Any slight side movement or " snick " from this point moving centrally into the graduation indicates need for further adjustment.

In using a scriber, the portion held should be tilted away from the rule or edge, as at C (right). With a tilt the other way (left), the error may not be great, but the line may be ragged-or broad if the fault is later corrected. Scribing against anything thicker than a rule, a considerable error may, of course, occur.

Lines may be scribed parallel to the edges of work by setting out the blade of a square or gauge, holding the scriber to the end and drawing along. The centre of flat parallel material may likewise be found, making the projection of the blade almost half the width of the material and scribing parallel lines, as at ***D***– or making a single line after carefully adjusting the gauge.



Centres of round stock may be found with the centre head or a square, as at ***E*** (right), or in V-blocks (left), using a surface gauge. With the centre head, intersecting lines locate the centre, but with V-blocks, it can be " boxed " if required.

Lines and circles can be divided as at ***F.*** Using centres T and U, arcs of dividers give position V at mid-distance. Then using this position and the other two, positions ***W*** and X can be located between them. To divide a circle into six, the radius dimension is spaced round the circumference. To divide it into four, points are taken at the circumference on a line Y-Yl, and arcs described whose intersections locate ❑