absorbs moisture from the atmosphere and becomes soft. This can be recognized because the paper expands and becomes wrinkled. It is necessary to select softer leads to offset the softening of the paper. If you have been using a 2H lead, for example, change to an F until the weather becomes drier.

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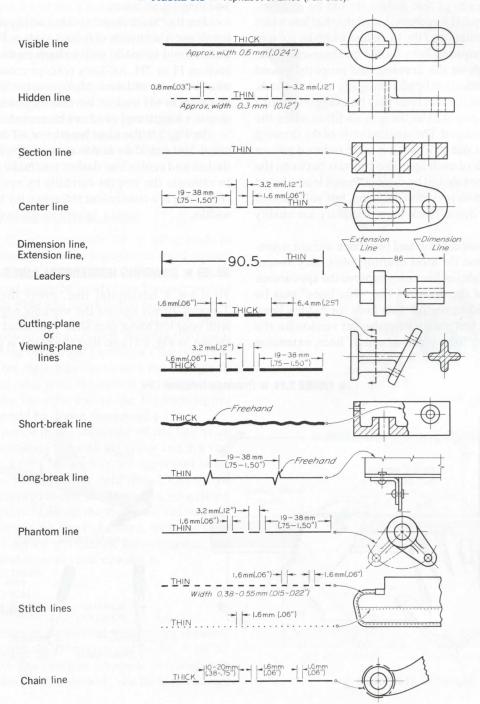
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3.8 - ALPHABET OF LINES

Each line on a technical drawing has a definite meaning and is drawn in a certain way. The line conventions endorsed by the American National Standards Institute, ANSI Y14.2M-1992, are presented in Fig. 3.9, together with illustrations of various applications.

■ FIGURE 3.9 ■ Alphabet of Lines (Full Size).



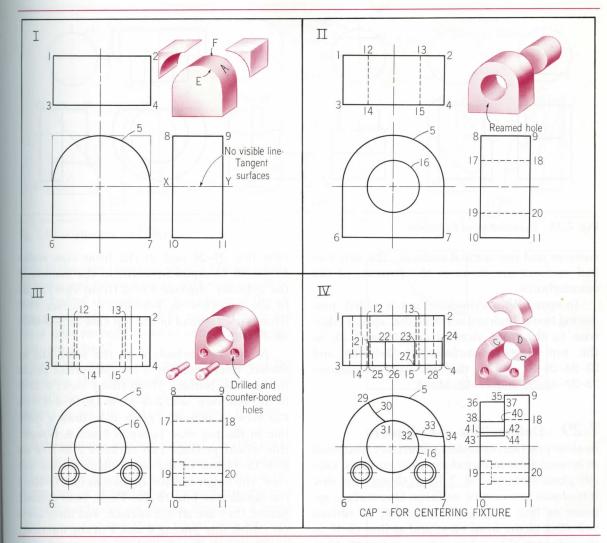


Fig. 7.32 Machining a Cap—Cylindrical Surfaces.

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The contour elements 5–8 and 7–10 in the front views appear as points 3 and 1 in the top views. The contour elements 11–14 and 13–16 in the side views appear as points 2 and 4 in the top views.

In Fig. 7.32 four possible stages in machining a Cap are shown, producing several cylindrical surfaces. In space I, the removal of the two upper corners forms cylindrical surface A which ap-

pears in the top view as surface 1-2-4-3, in the front view as arc 5, and in the side view as surface 8-9-Y-X.

In space II, a large reamed hole shows in the front view as circle 16, in the top view as cylindrical surface 12–13–15–14, and in the side view as cylindrical surface 17–18–20–19.

In space III, two drilled and counterbored holes are added, producing four more cylindrical



truments on Layout or A4–2 (adjusted), axes chosen to show

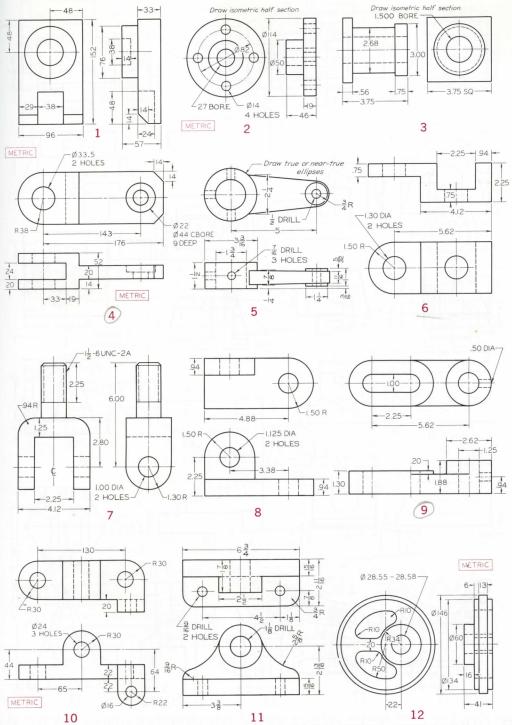
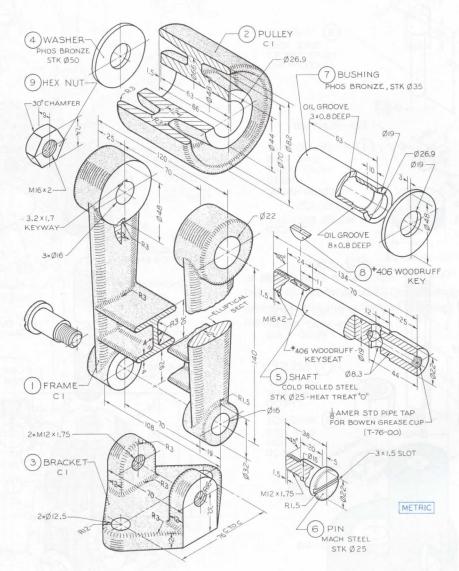


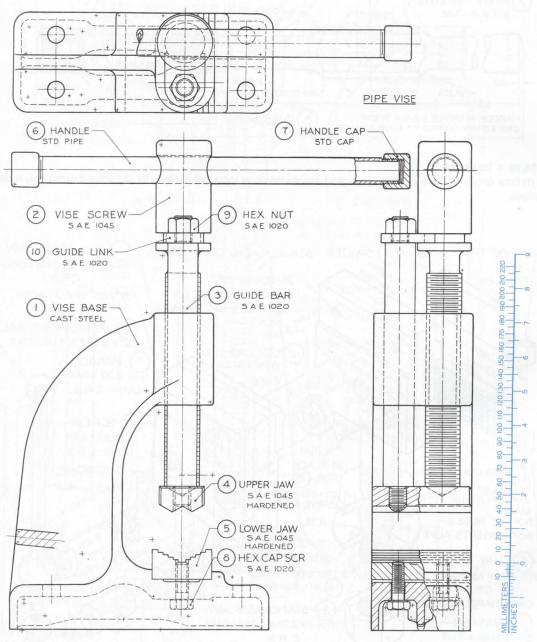
Fig. 18.56 (1) Make isometric freehand sketches. (2) Make isometric drawings with instruments, using Size A or A4 sheet or Size B or A3 sheet, as assigned. (3) Make dimetric drawings with instruments, using Size A or A4 sheet or Size B or A3 sheet, as assigned, and position assigned from Fig. 18.42. (4) Make trimetric drawings, using instruments, with axes chosen to show the objects to best advantage. If dimensions are required, study §18.25.



■ FIGURE 14.68 ■ Belt Tightener.

Prob. 14.40: (1) Draw details. (2) Draw assembly. It is assumed that the parts are to be made in quantity and they are to be dimensioned for interchangeability on the detail drawings. Use tables in Appendixes 11–14 for limit values. Design as follows.

- a. Bushing fit in pulley: Locational interference fit.
- b. Shaft fit in bushing; Free running fit.
- c. Shaft fits in frame: Sliding fit.
- d. Pin fit in frame: Free running fit.
- e. Pulley hub length plus washers fit in frame: Allowance 0.13 and tolerances 0.10.
- f. Make bushing 0.25 mm shorter than pulley hub.
- g. Bracket fit in frame: Same as e above.



■ FIGURE 14.74 ■ Pipe Vise.

Prob. 14.46: (1) Draw details. (2) Draw assembly. To obtain dimensions, take distances directly from figure with dividers; then set dividers on printed scale and read measurements in millimeters or decimal inches as assigned. All threads are general-purpose metric threads (see Appendix 15) or Unified coarse threads except the American National Standard pipe threads on handle and handle caps.

