

Figure 3-1
Principal Items of Equipment.

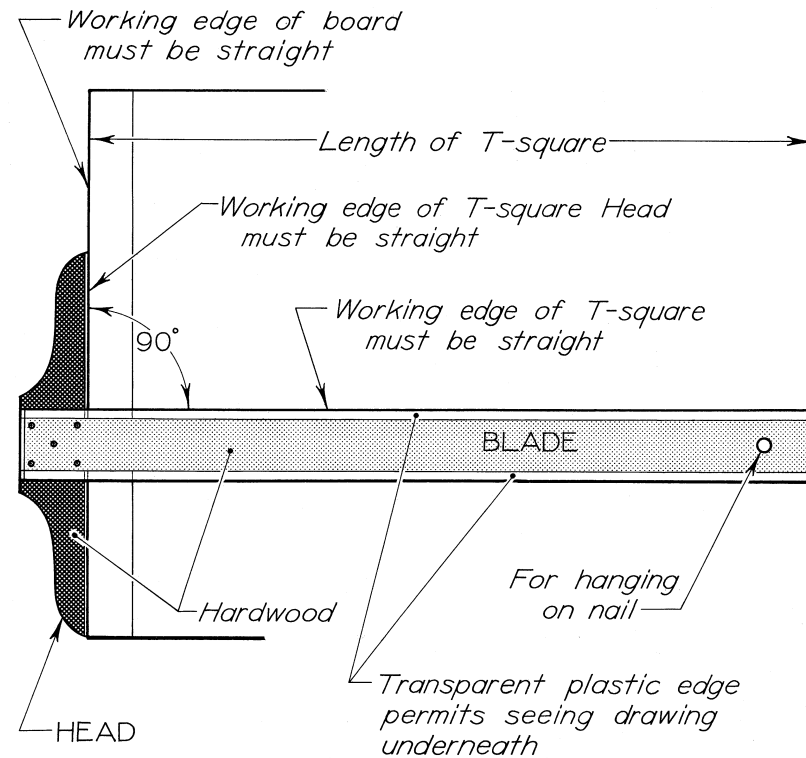


Figure 3-2
The T-square.

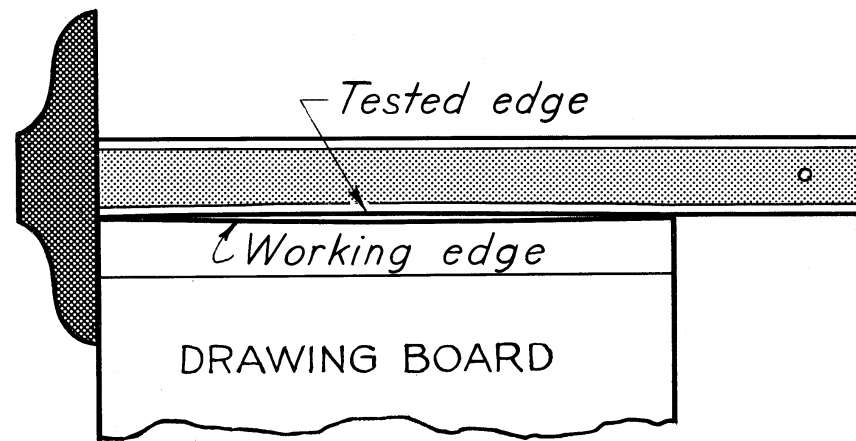


Figure 3-3
Testing the Working Edge of the Drawing Board.

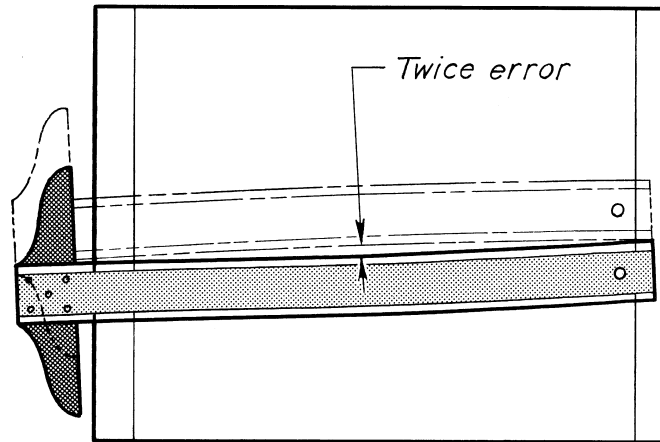


Figure 3-4
Testing the T-square.

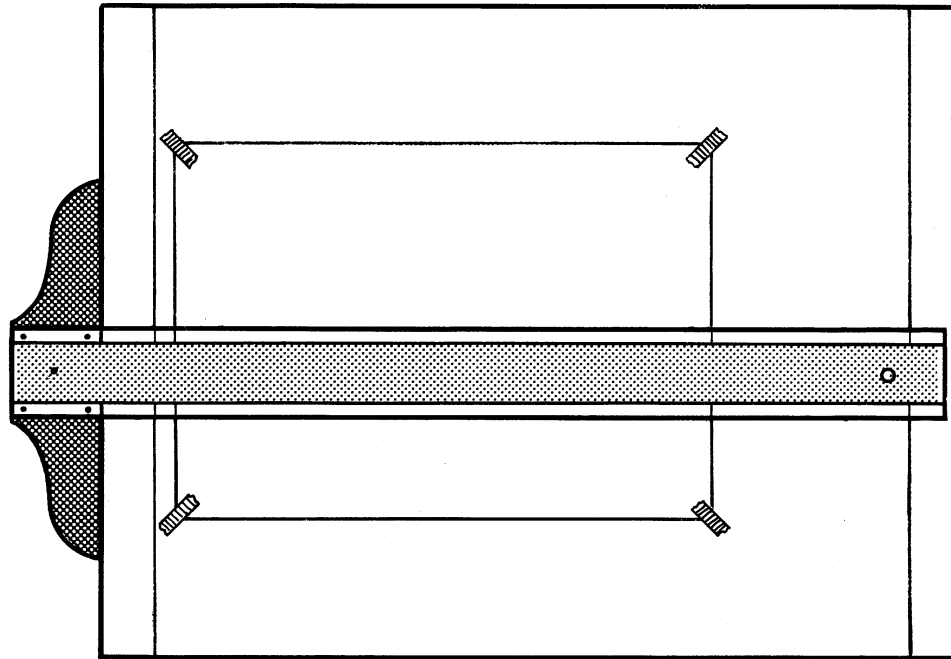


Figure 3-5
Placing Paper on Drawing Board.

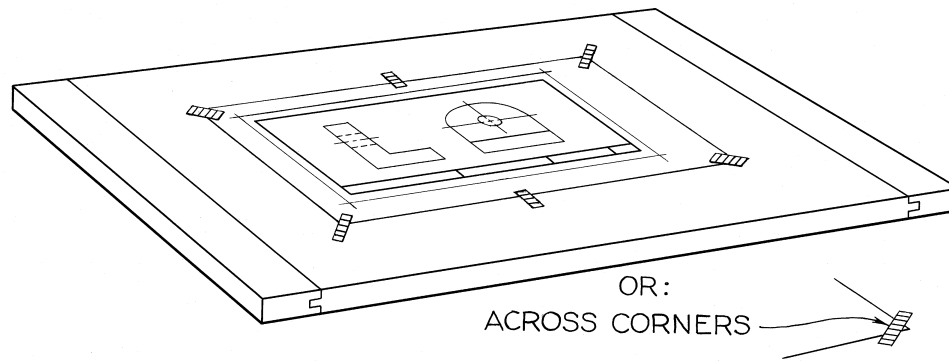


Figure 3-6
Positions of Drafting Tape.

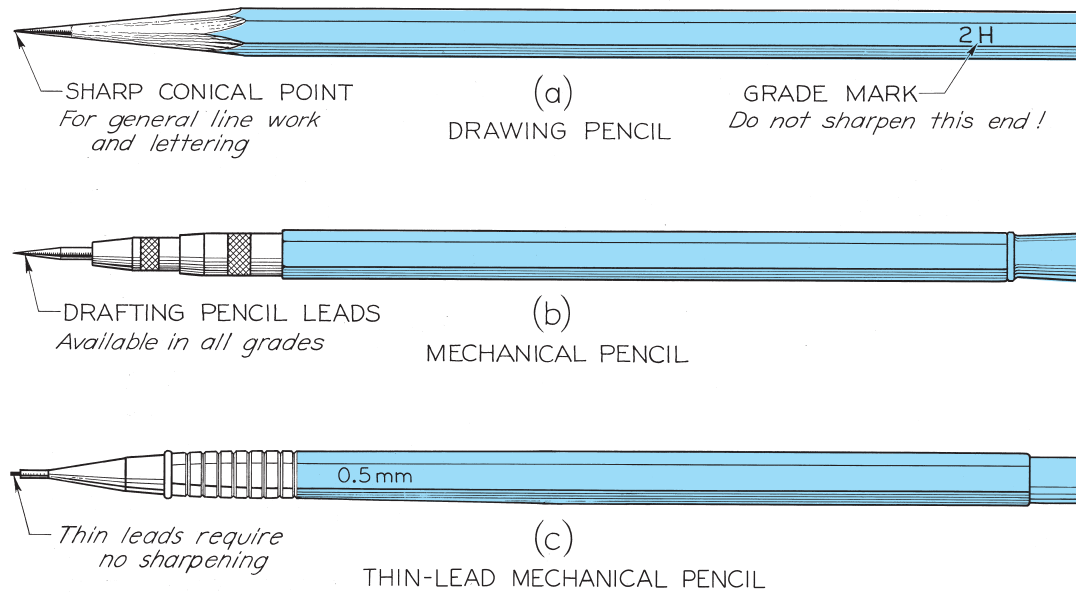


Figure 3-7
Drawing Pencils.

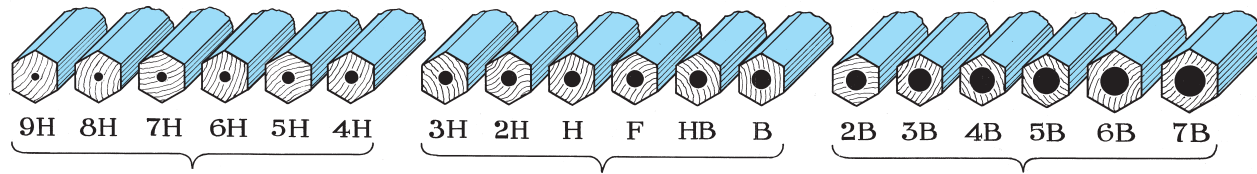


Figure 3-8
Lead Grade Chart.

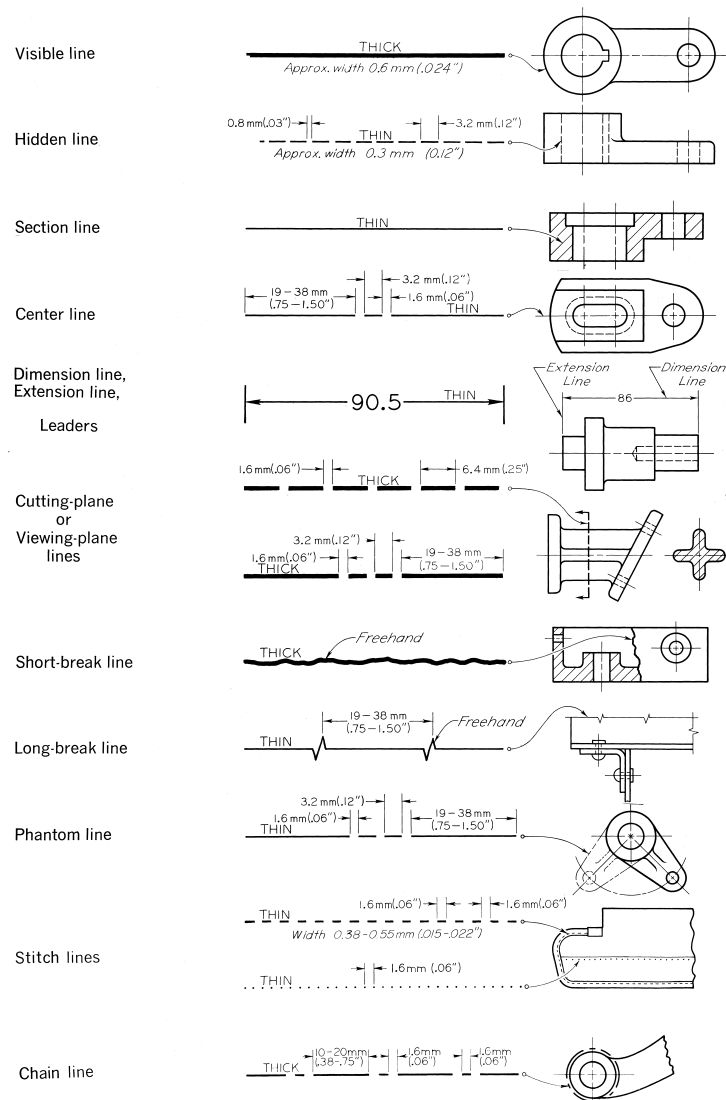


Figure 3-9
Alphabet of Lines (Full Size).

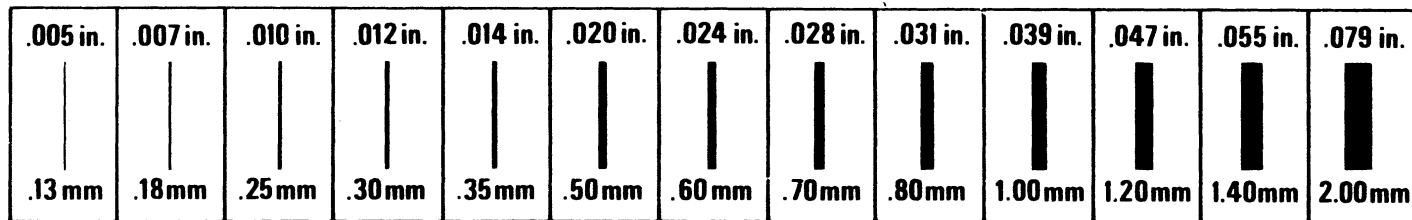


Figure 3-10

Line Gage. *Courtesy of Koh-I-Noor Rapidograph, Inc.*

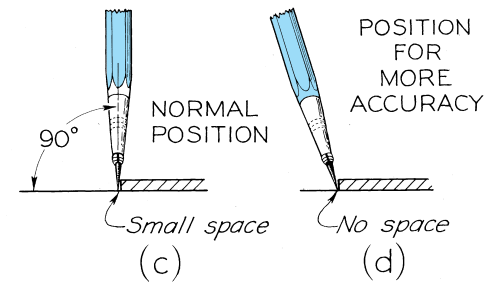
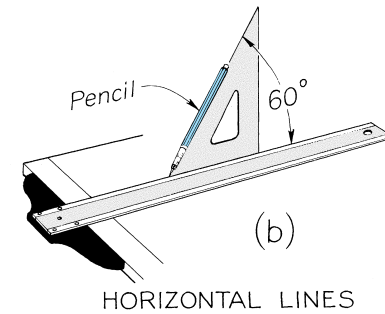
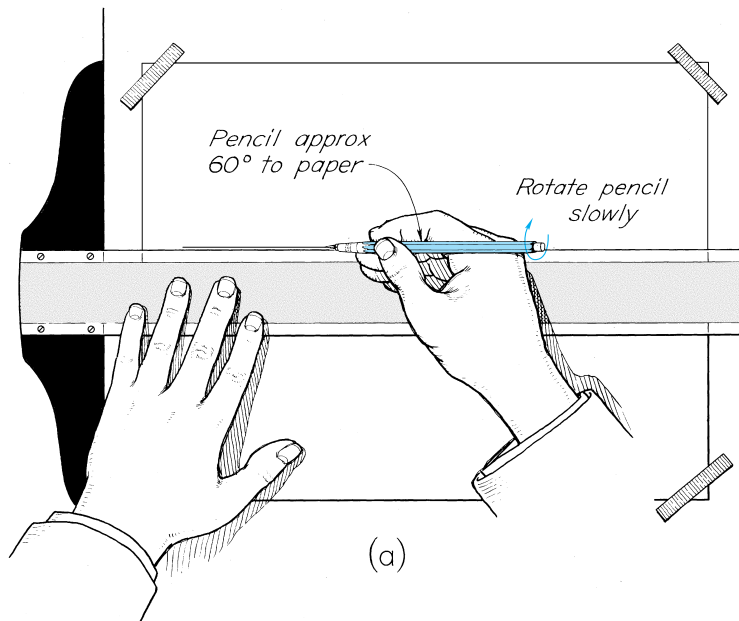


Figure 3-11
Drawing a Horizontal Line.

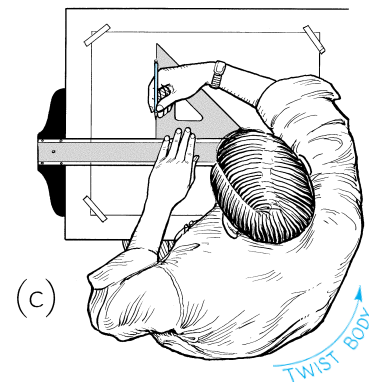
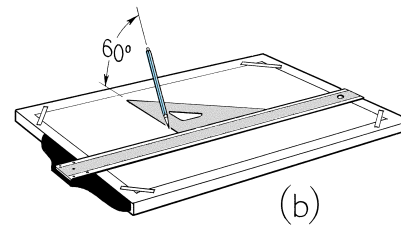
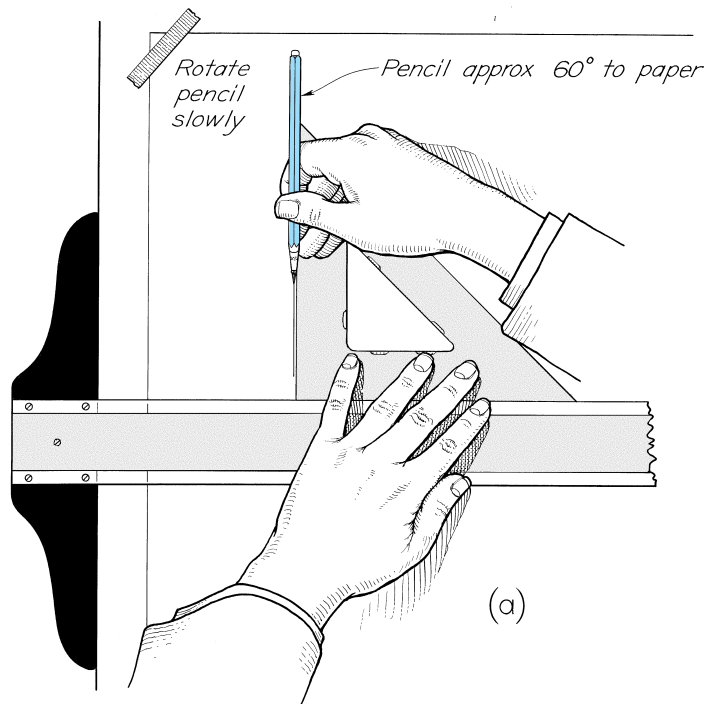


Figure 3-12
Drawing a Vertical Line.

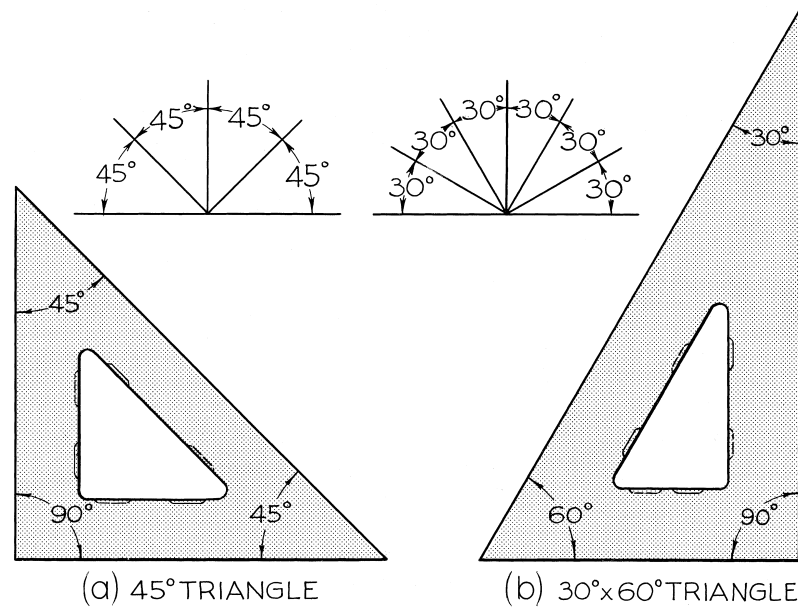


Figure 3-13
Triangles.

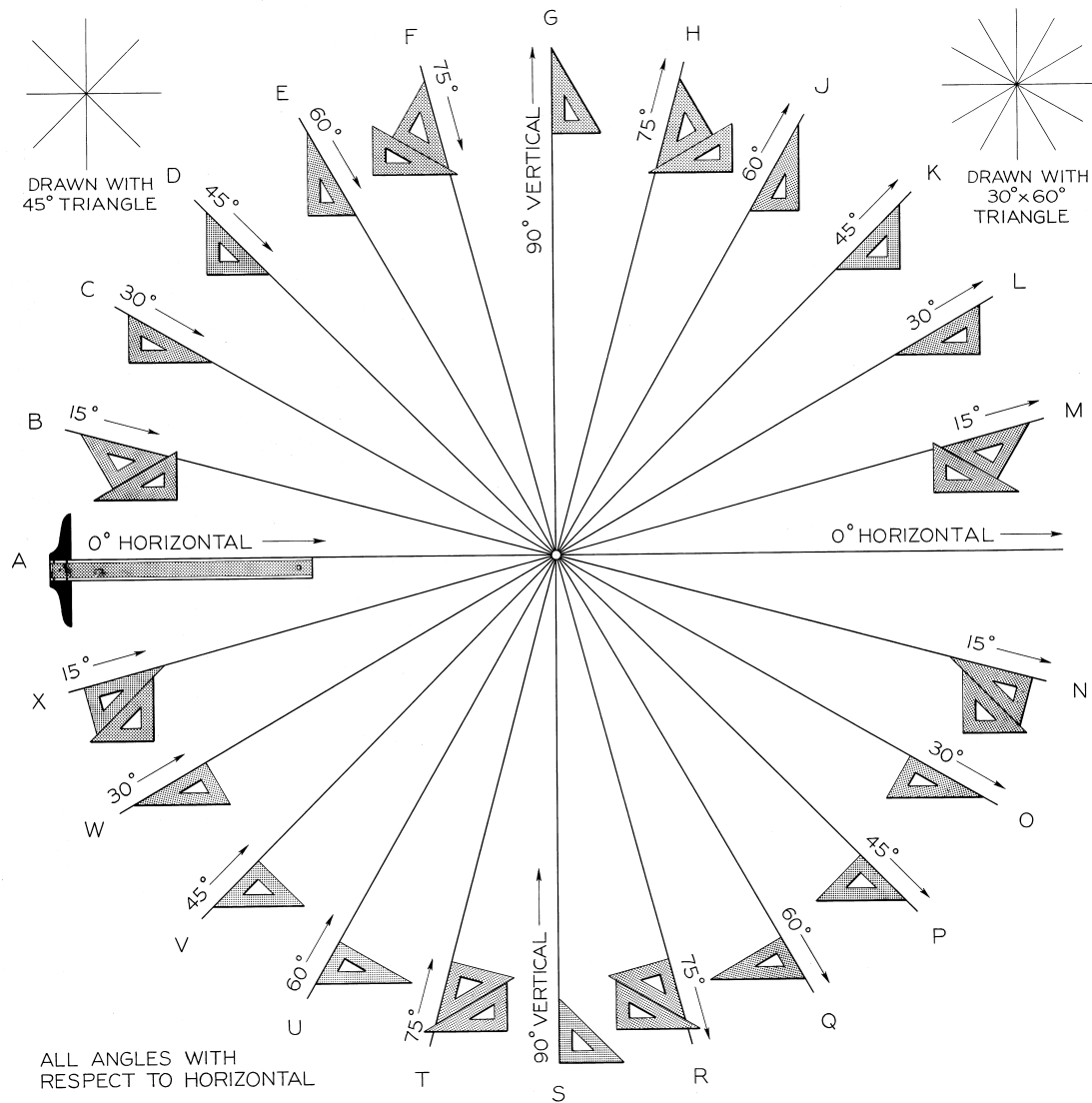


Figure 3-14
The Triangle Wheel.

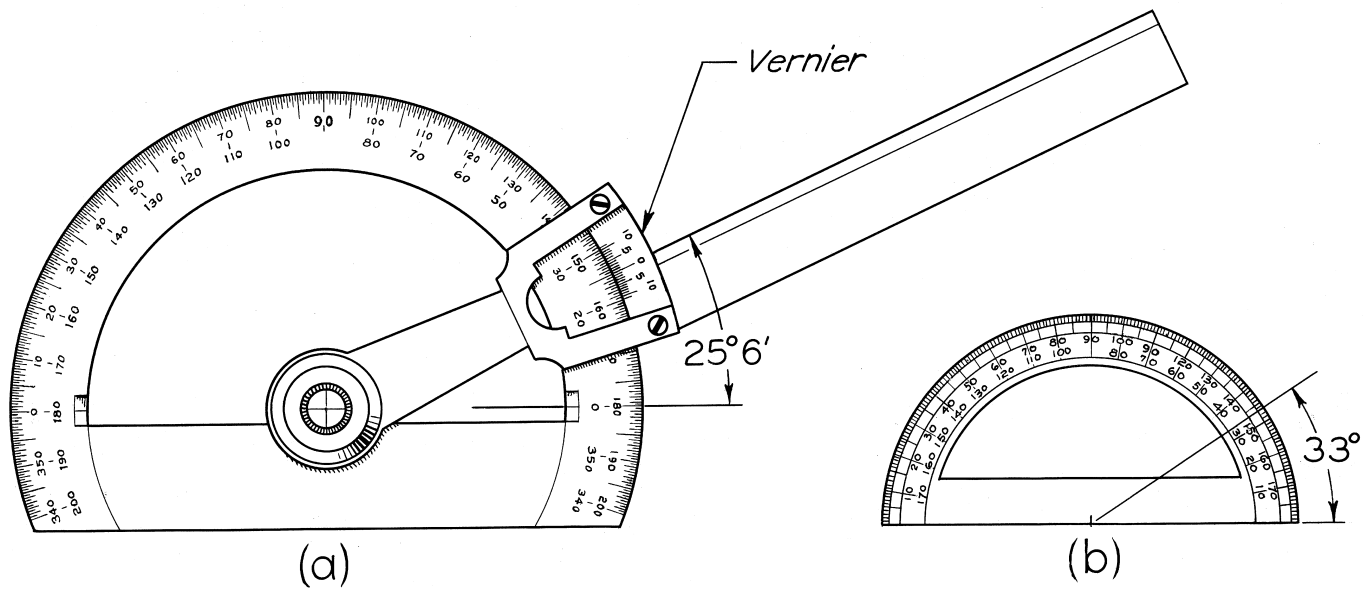


Figure 3-15
Protractors.

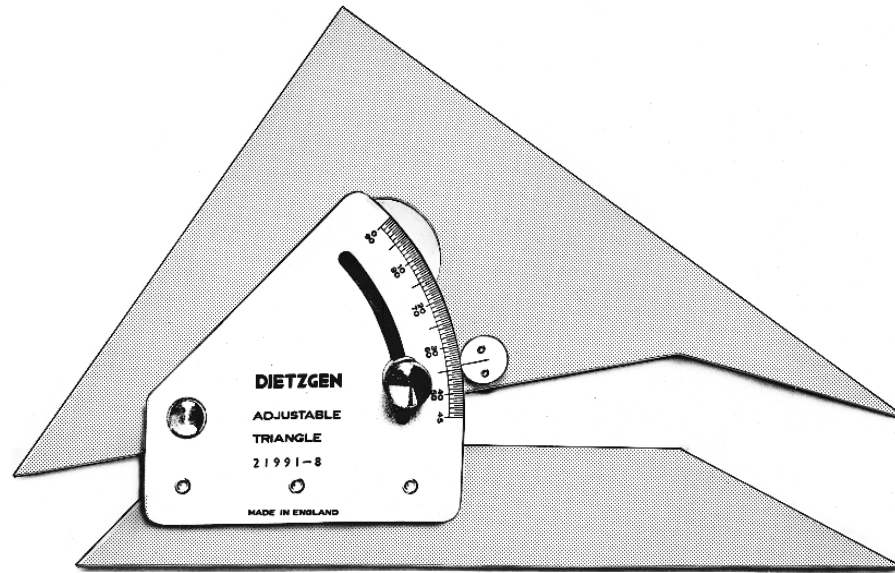


Figure 3-16
Adjustable Triangle.

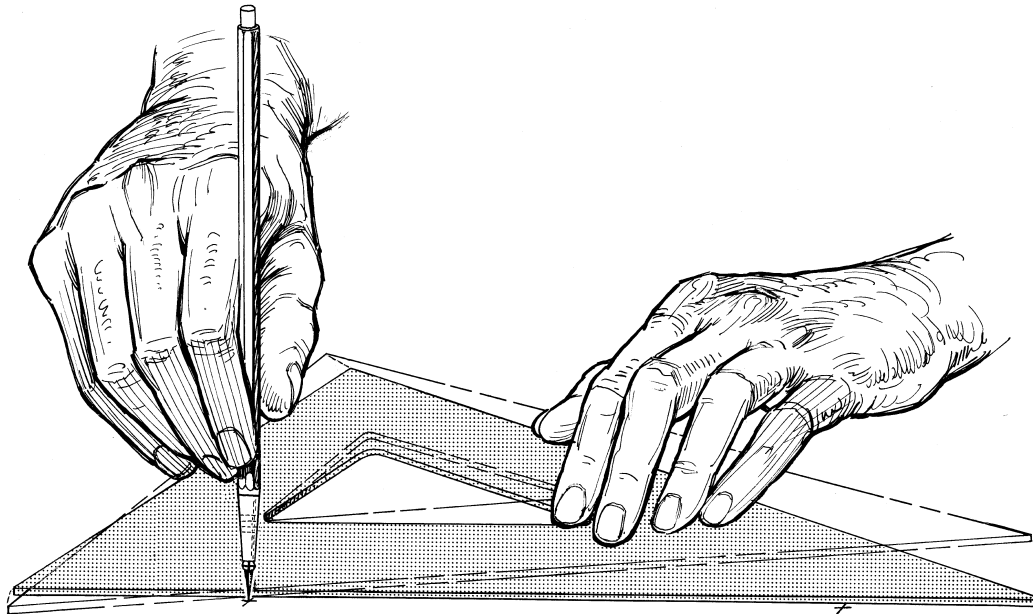


Figure 3-17
To Draw a Pencil Line Through Two Points.

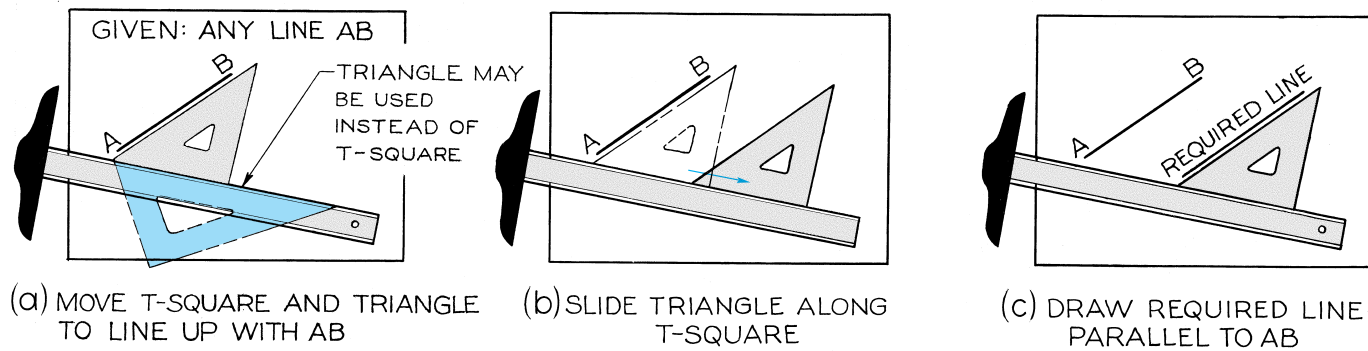


Figure 3-18
To Draw a Line Parallel to a Given Line.

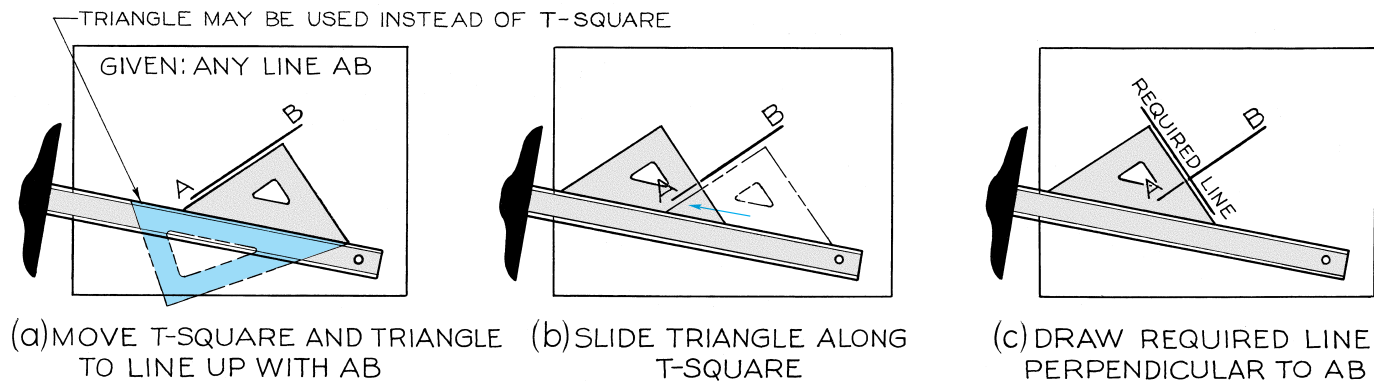


Figure 3.19
To Draw a Line Perpendicular to a Given Line.

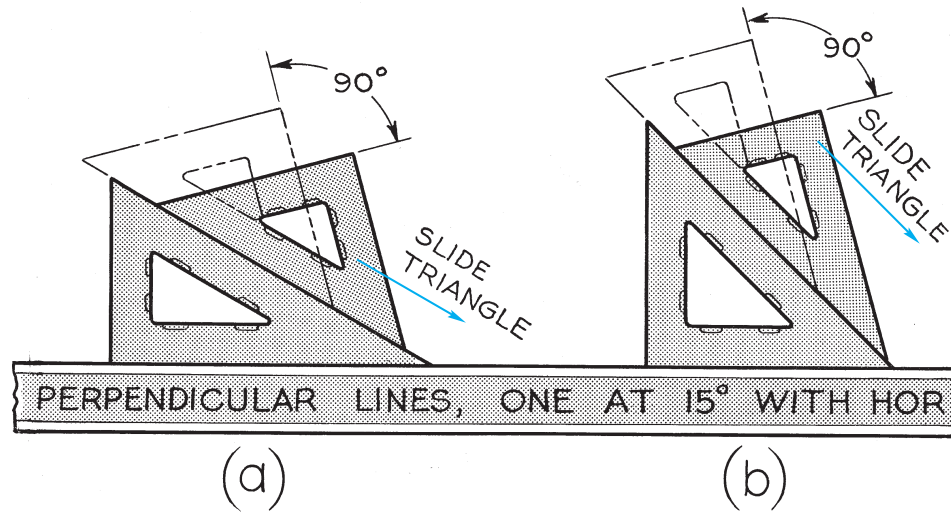


Figure 3-20
Perpendicular Lines.

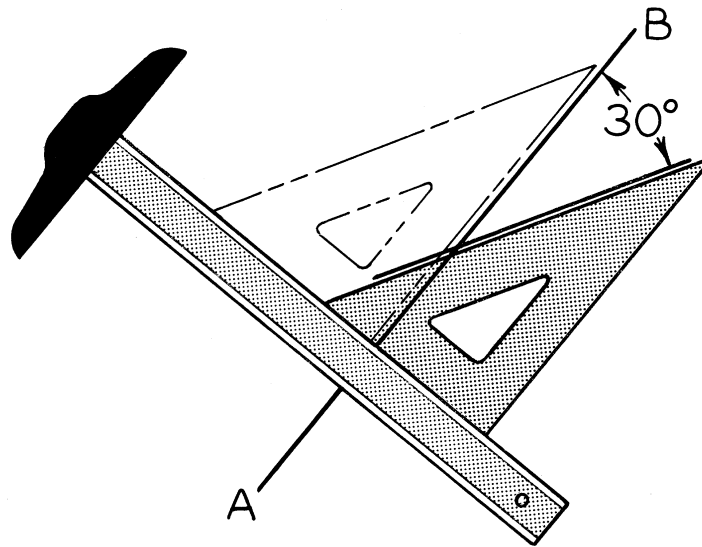
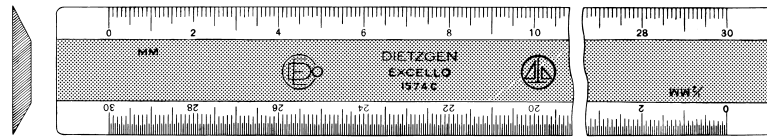
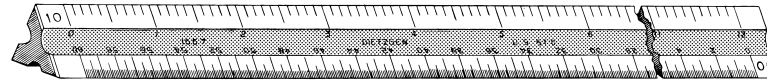


Figure 3-21

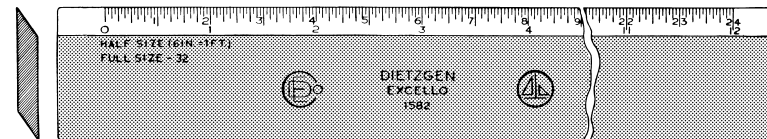
Line at 30° with Given Line.



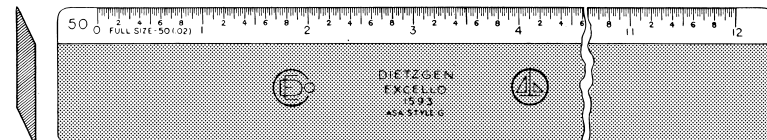
(a) Metric Scale



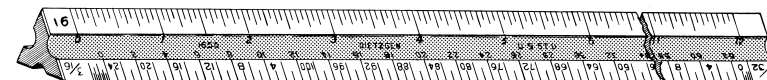
(b) Engineers' Scale



(c) Decimal Scale



(d) Mechanical Engineers' Scale



(e) Architects' Scale

Figure 3-22
Types of Scales.

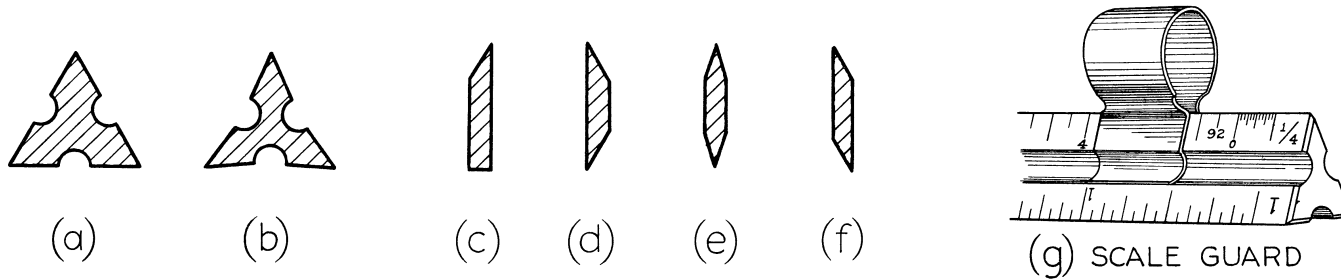
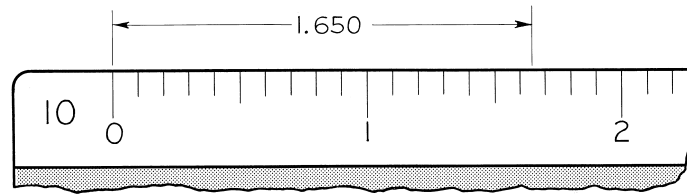
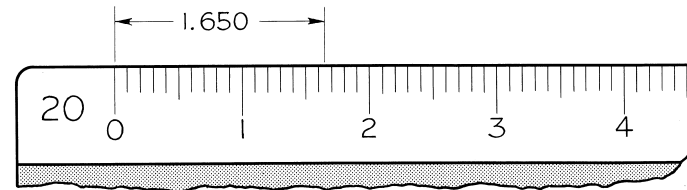


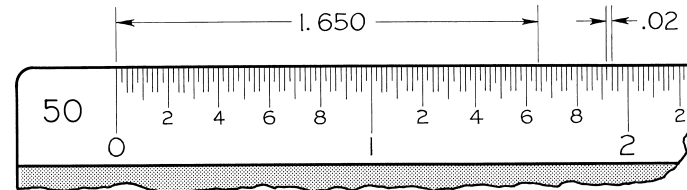
Figure 3-23
Scale Guard.



(a) FULL SIZE



(b) HALF SIZE



(c) FULL SIZE

Figure 3-24
Decimal Dimensions.

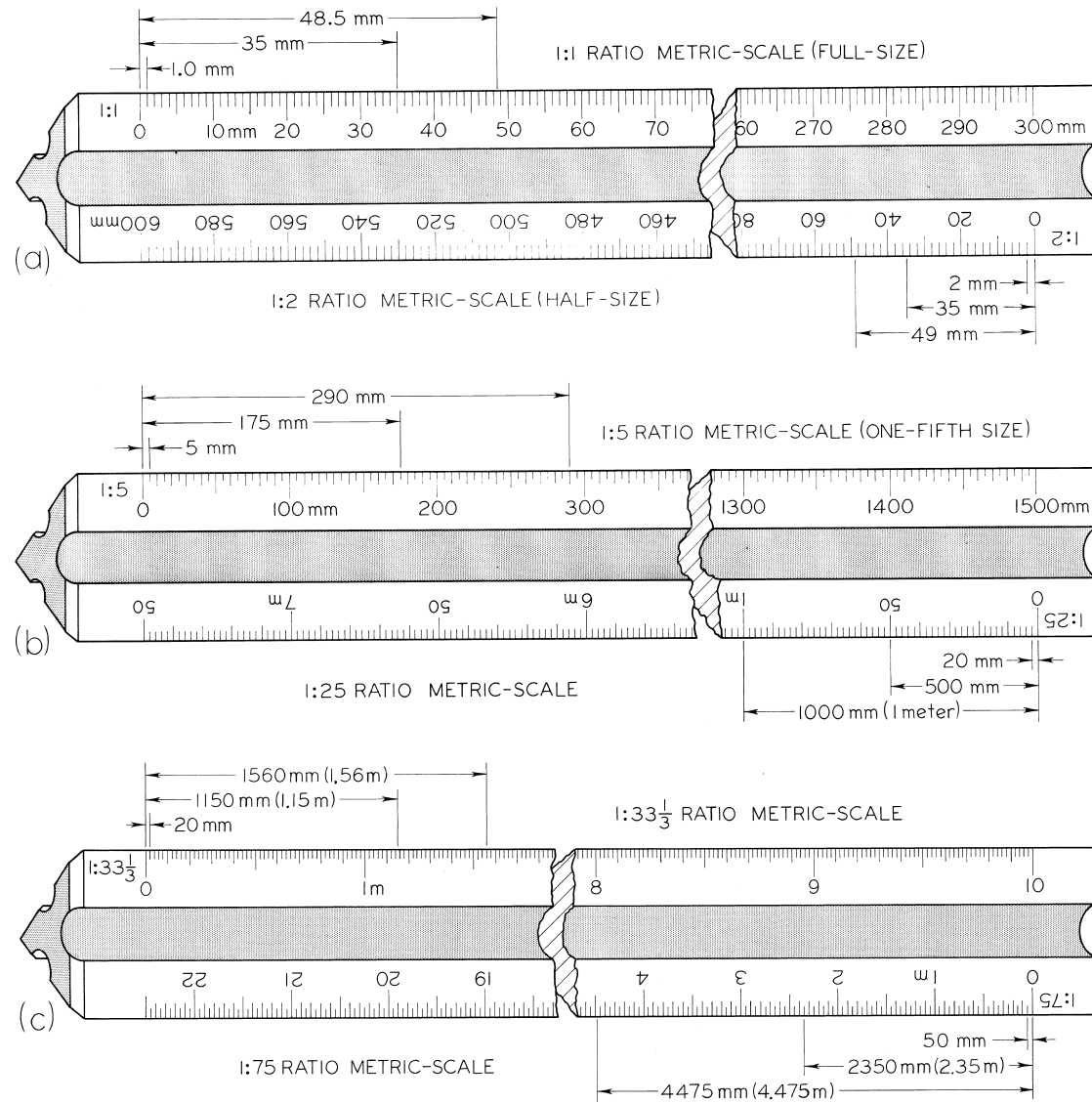


Figure 3-25
Metric Scales.

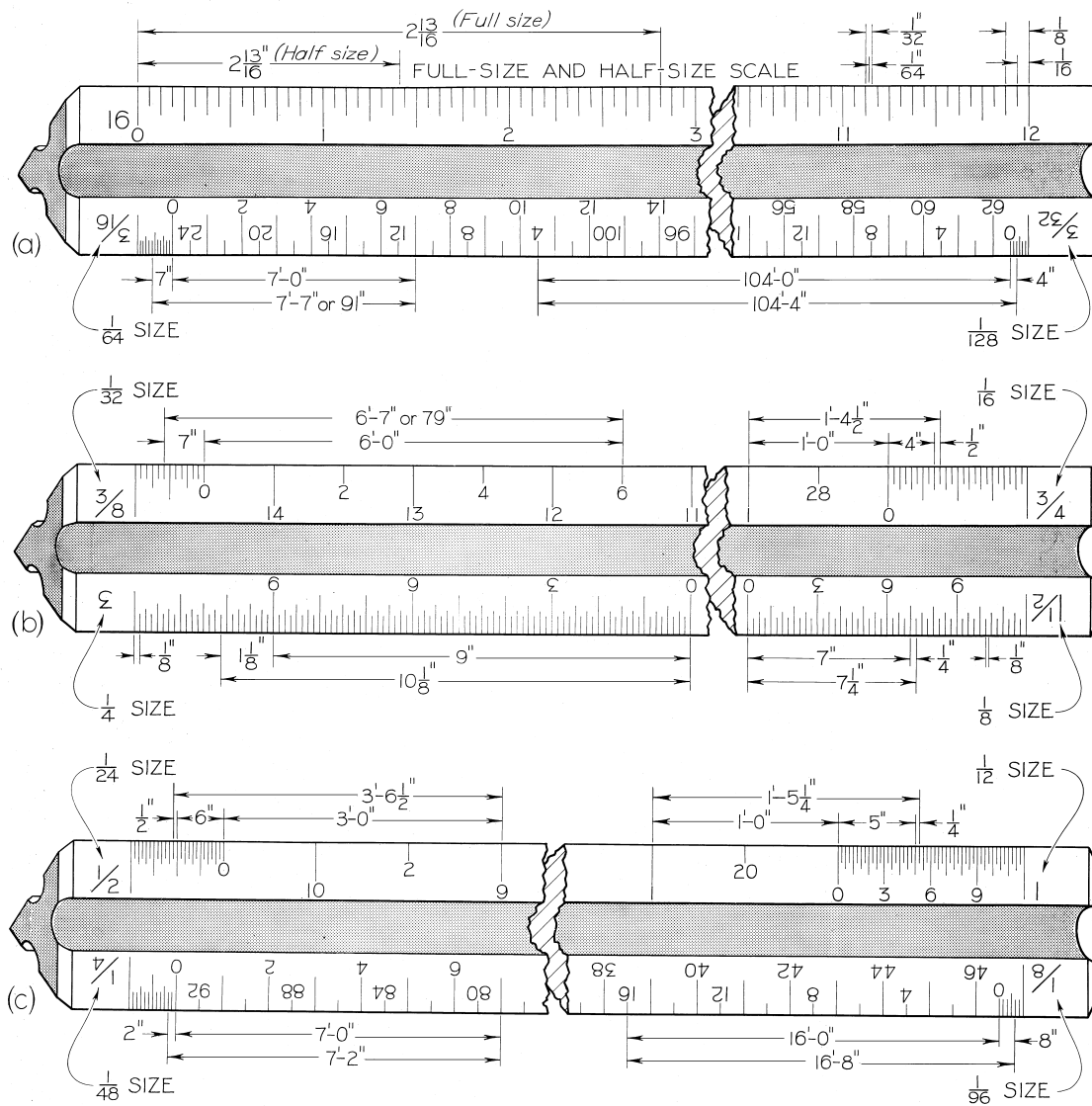


Figure 3-26
Architects' Scales.

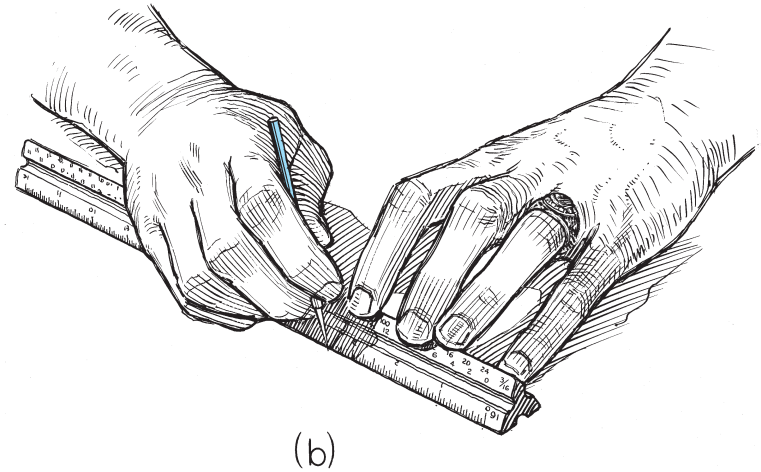
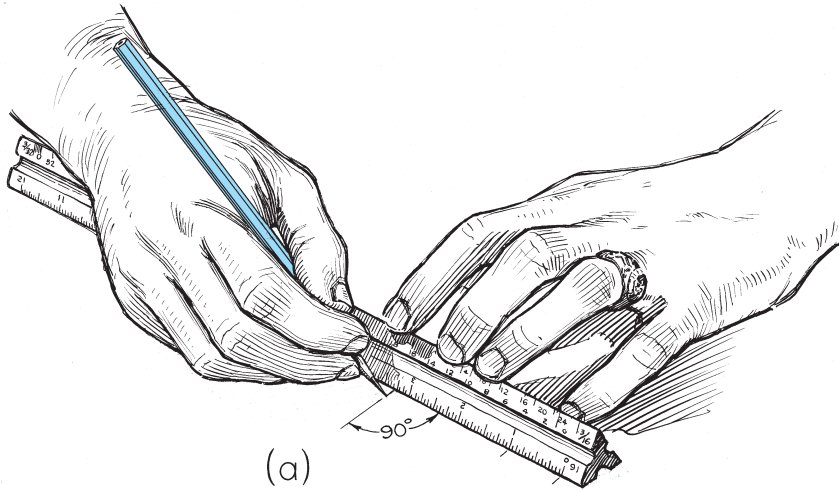


Figure 3-27
Accurate Measurements.

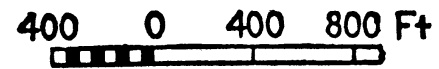


Figure 3-27.1

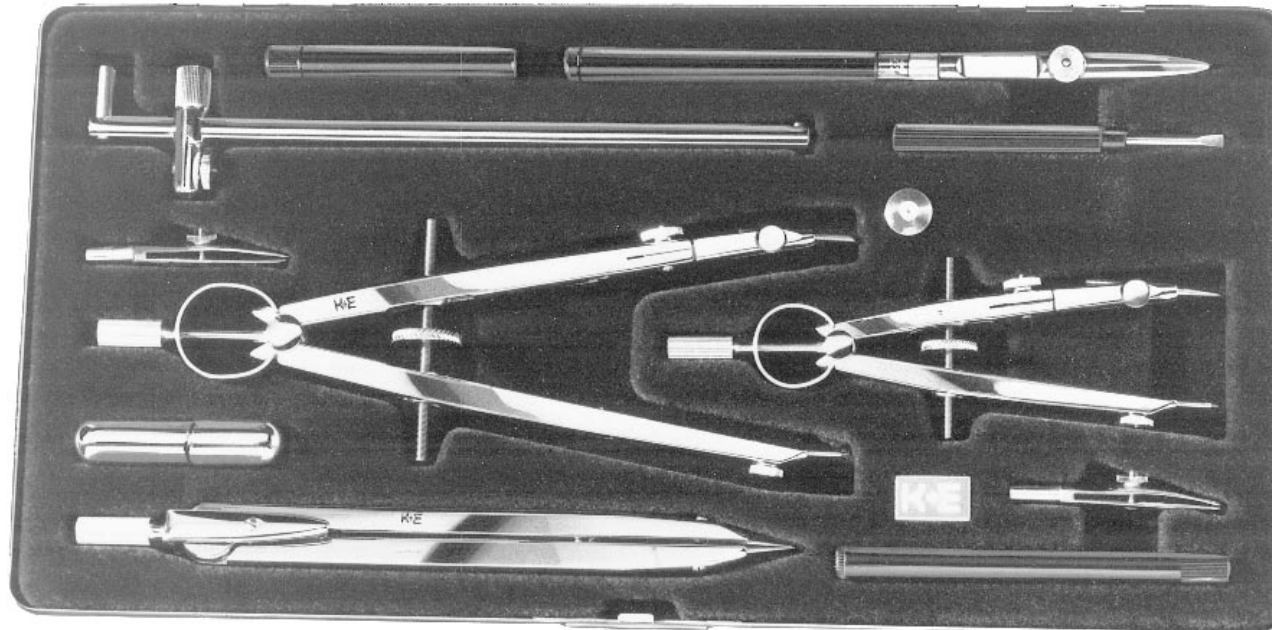
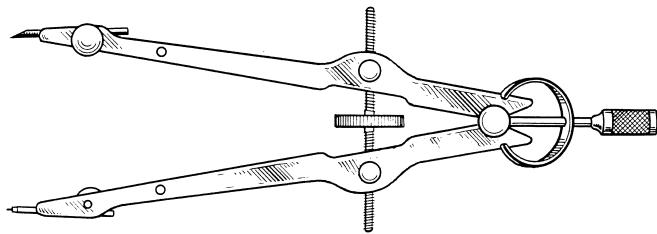
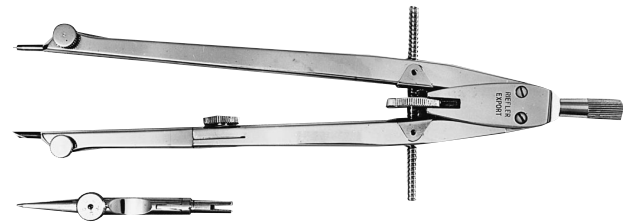


Figure 3-28

Giant Bow Set. *Courtesy of Frank Oppenheimer.*



(a) CENTER-WHEEL



(b) QUICKACTING

Figure 3-29
Giant Bow Compass.

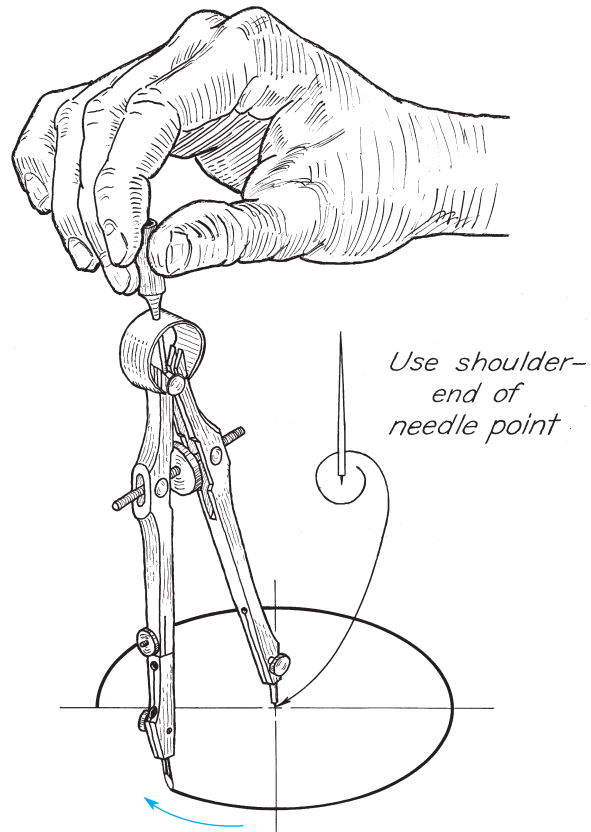


Figure 3-30
Using the Giant Bow Compass.

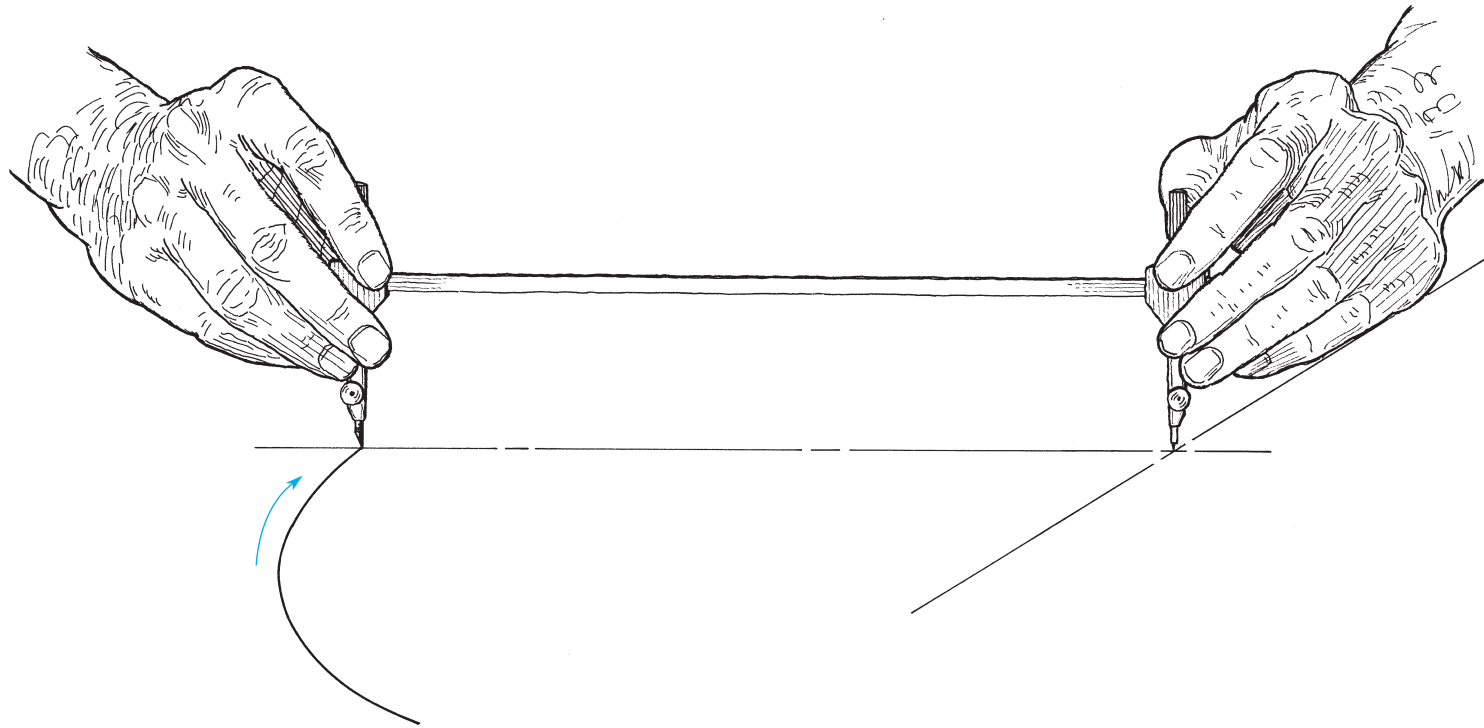


Figure 3-31

Drawing a Circle of Large Radius with the Beam Compass.

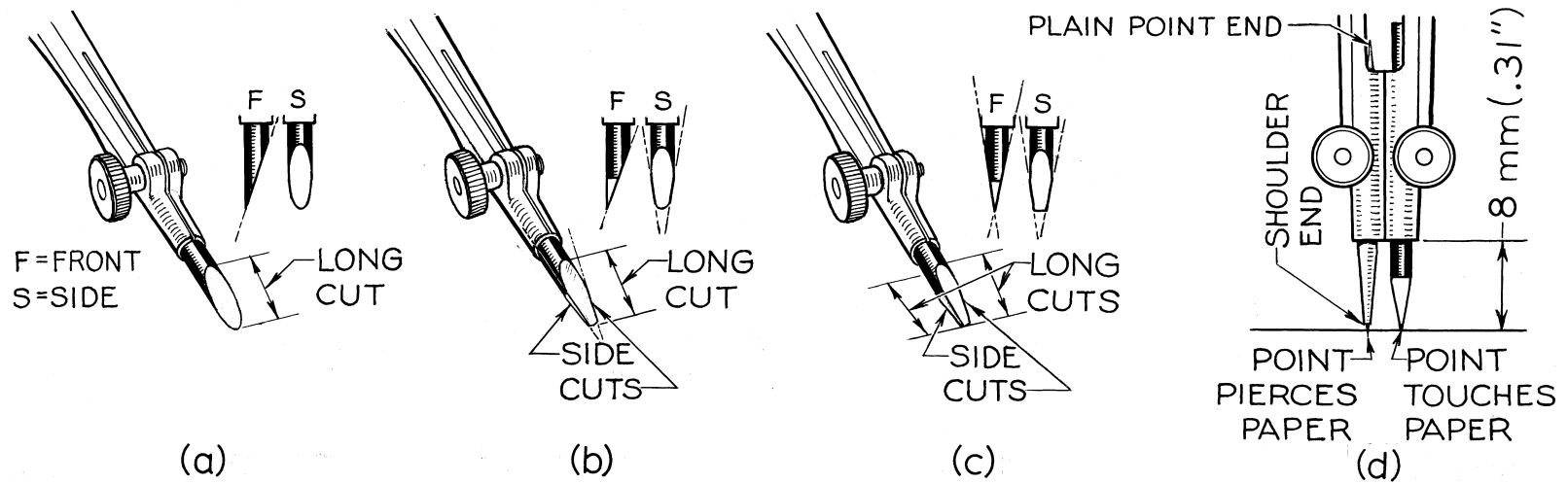


Figure 3-32
Compass Lead Points.

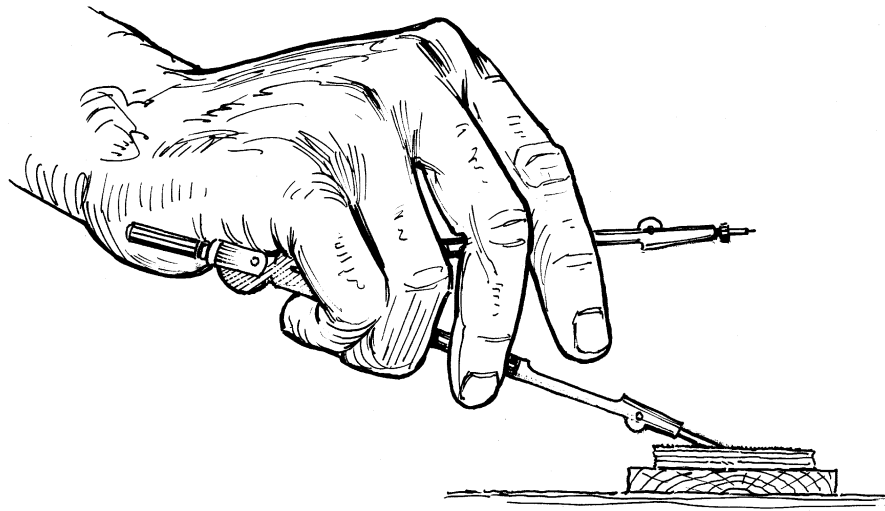


Figure 3-33
Sharpening Compass Lead.

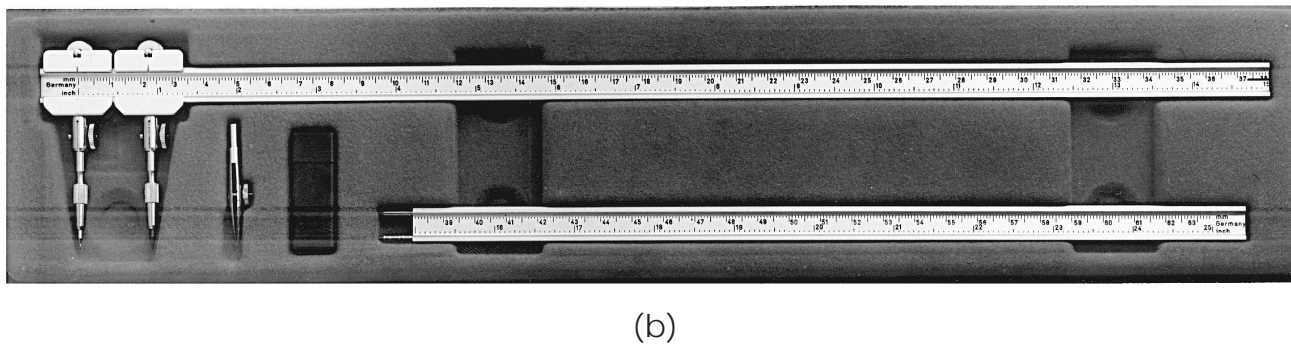
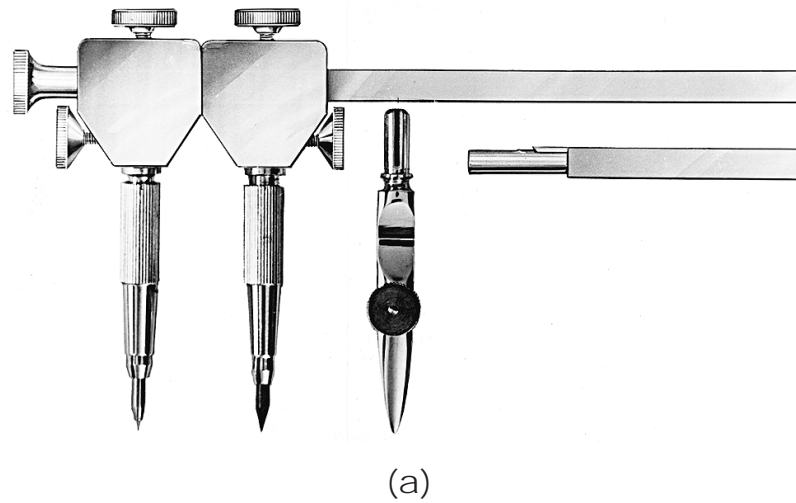


Figure 3-34

Beam Compass Sets.

(a) Courtesy of Frank Oppenheimer; (b) Courtesy of Tacro, Div. of A&T Importers, Inc.

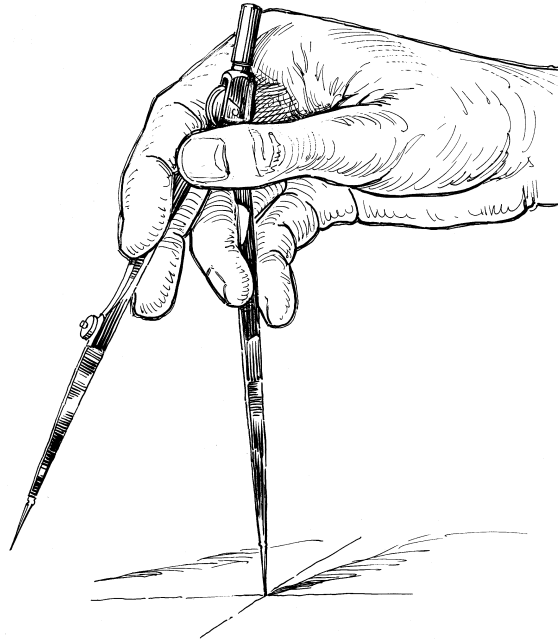


Figure 3-35
Adjusting the Dividers.

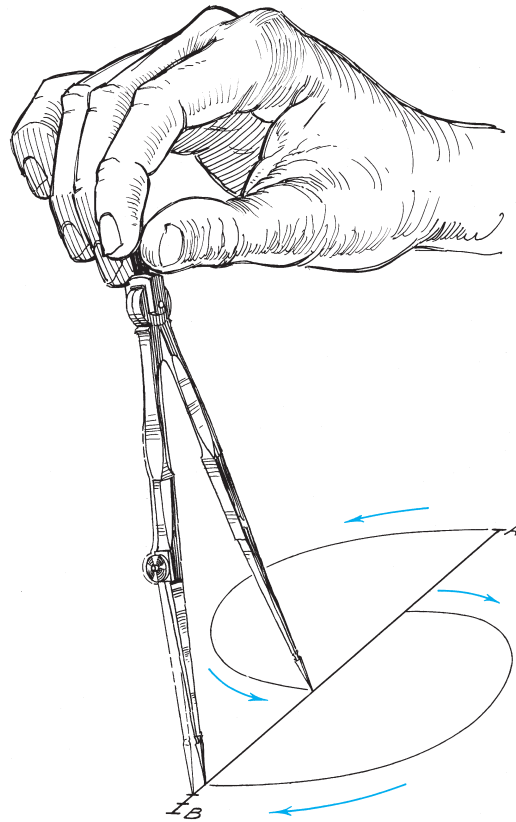


Figure 3-36
Using the Dividers.

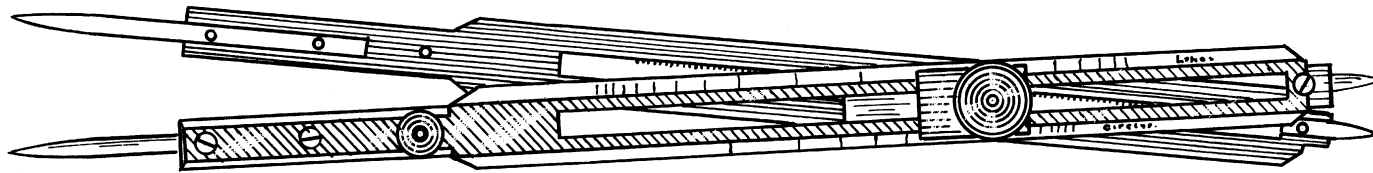


Figure 3-37
Proportional Dividers.

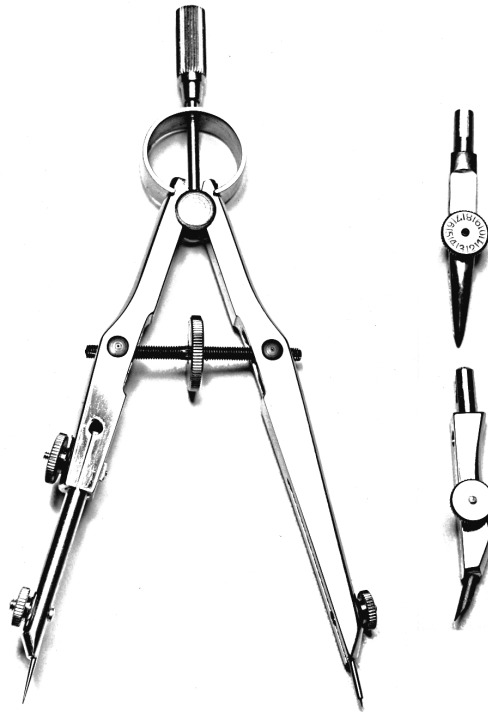


Figure 3-38

Combination Pen and Pencil Bow. *Courtesy of Frank Oppenheimer.*

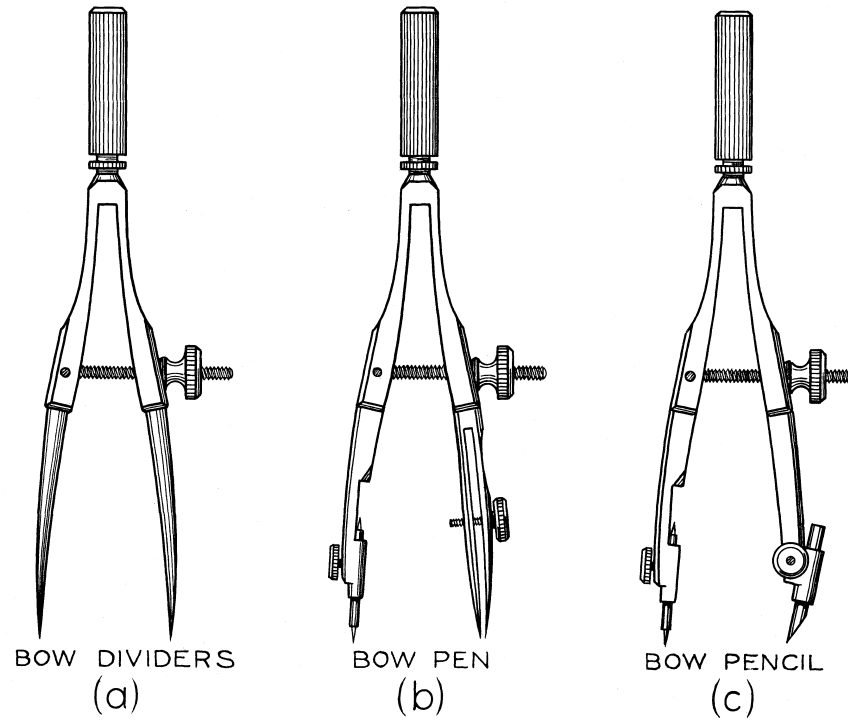


Figure 3-39
Bow Instruments with Side Wheel.

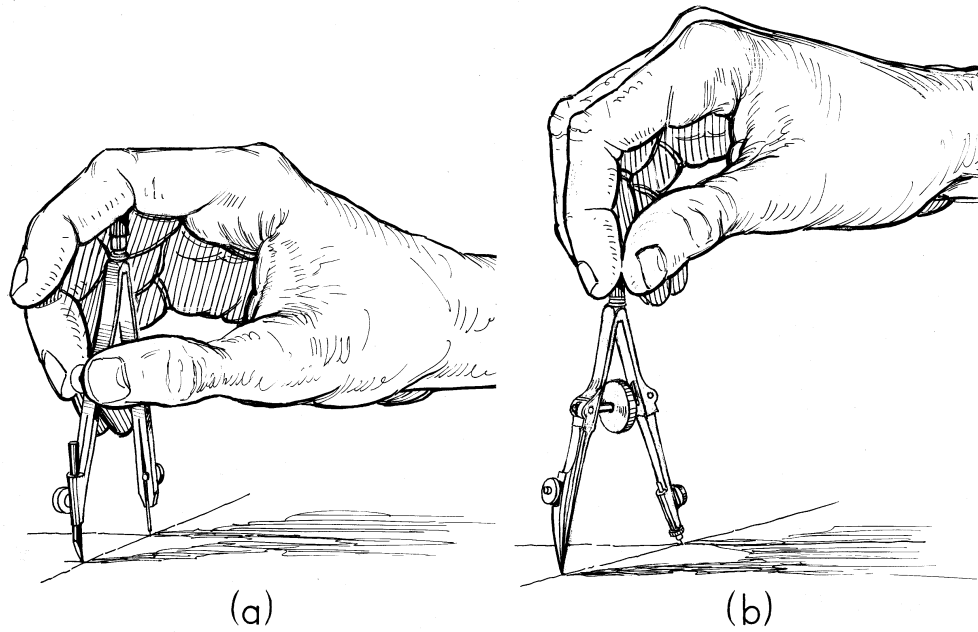


Figure 3-40
Using the Bow Instruments.

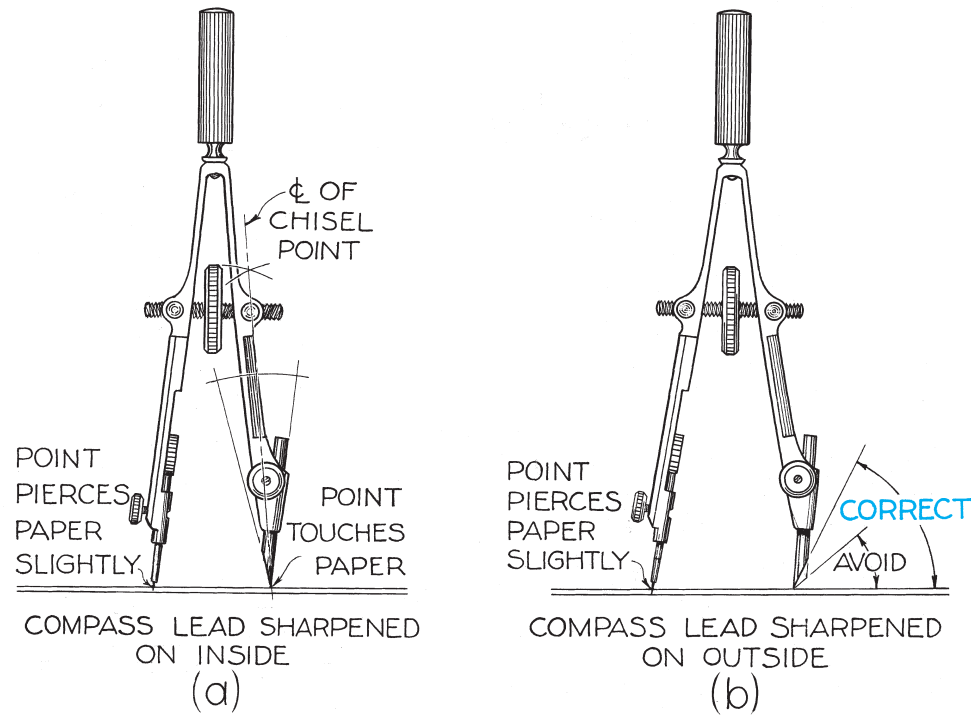


Figure 3-41
Compass-Lead Points.

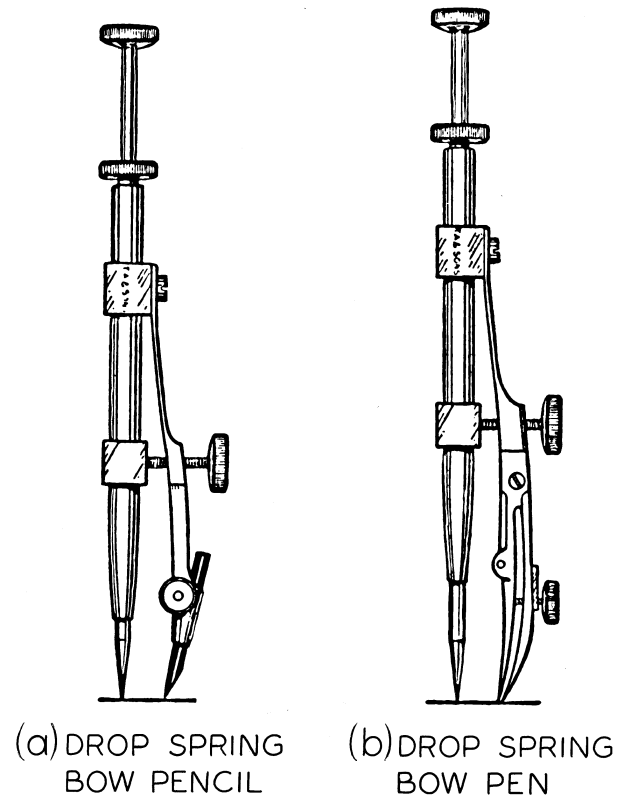


Figure 3-42
Drop Spring Bow Instruments.

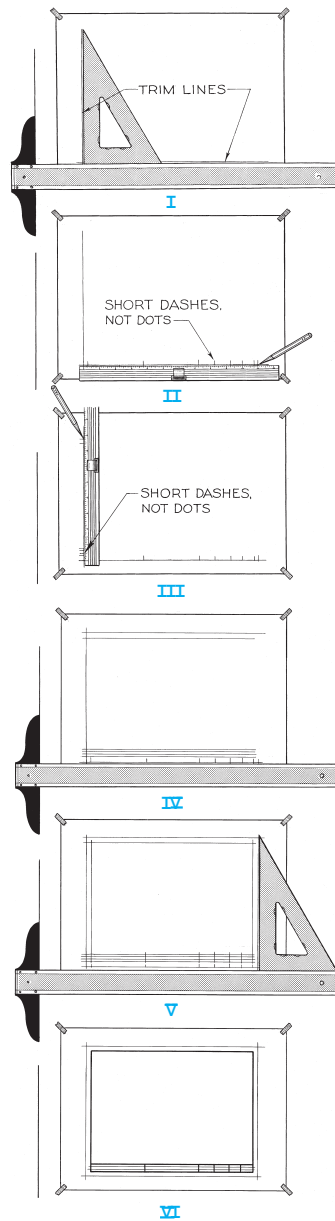
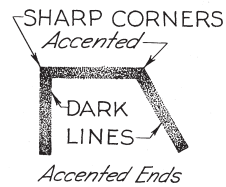
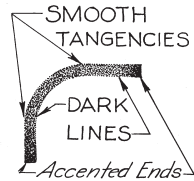


Figure 3-43

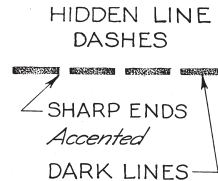
To Lay Out a Sheet. Layout A-2; see inside front cover.



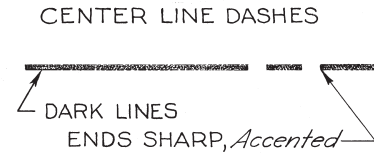
THIS



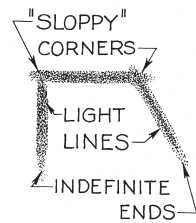
THIS



THIS

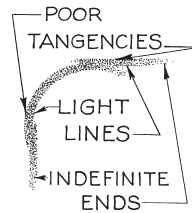


THIS



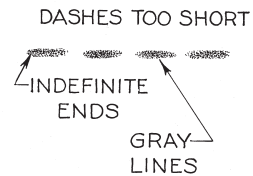
NOT THIS

(a)



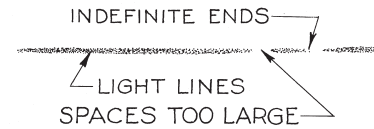
NOT THIS

(b)



NOT THIS

(c)



NOT THIS

(d)

Figure 3-44
Technique of Lines (Enlarged).

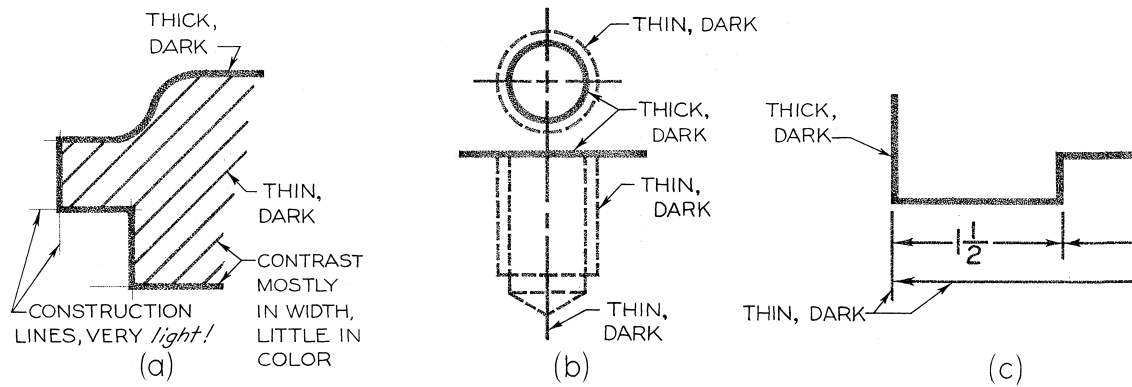


Figure 3-45
Contrast of Lines (Enlarged).



Figure 3-46

Technical Fountain Pen and Pen Set. *Courtesy of Koh-I-Nor Rapidograph, Inc.*



Figure 3-47
Using the Technical Fountain Pen.

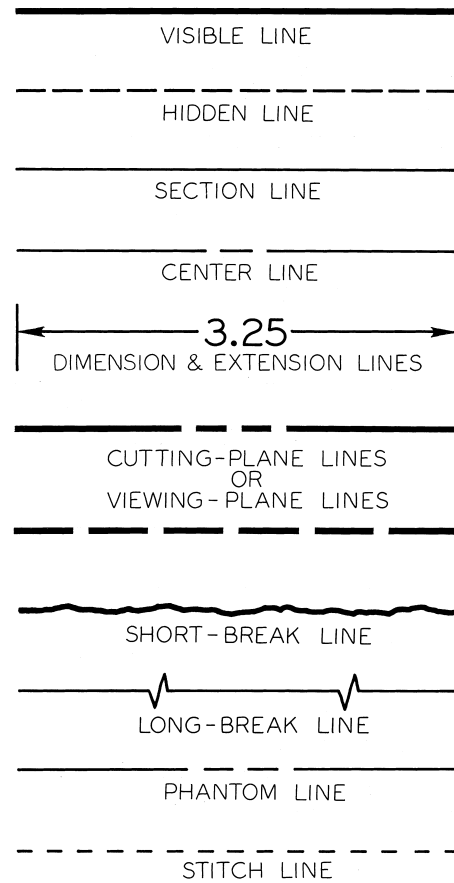


Figure 3-48
Alphabet of Ink Lines (Full Size).

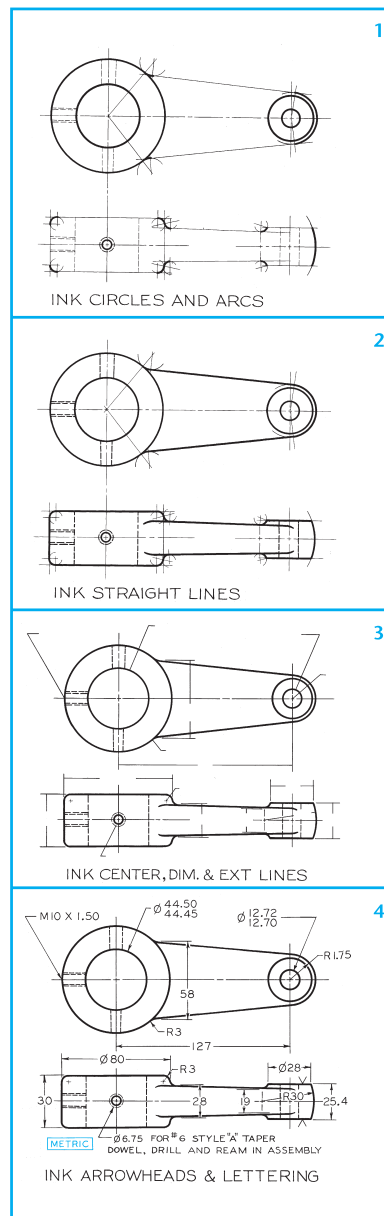


Figure 3-49
Order of Inking.

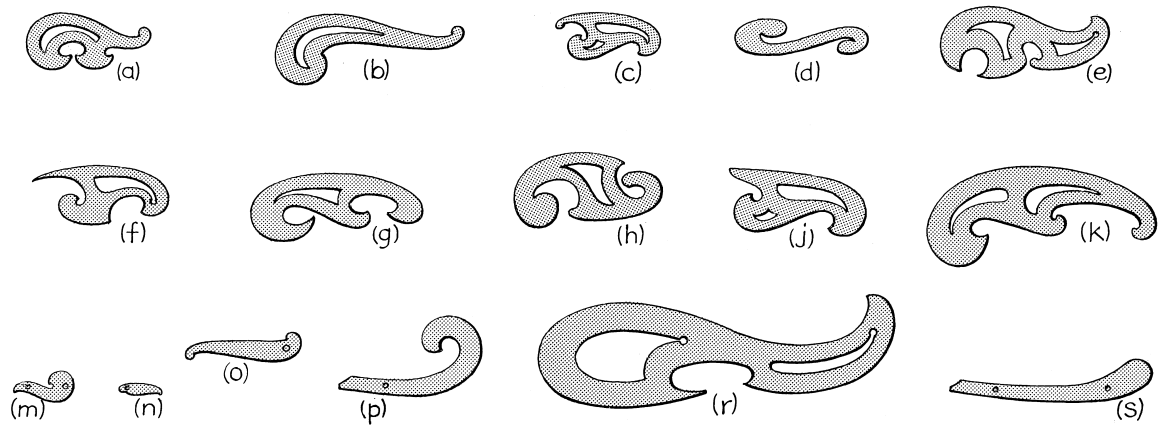
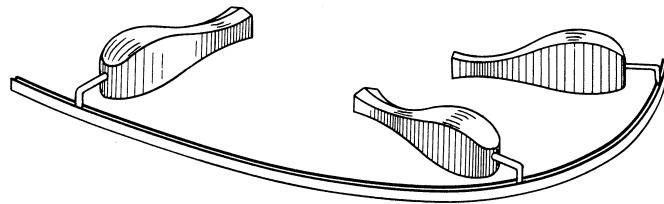


Figure 3-50
Irregular or French Curves.



(a)



(b)

Figure 3-51
Adjustable Curves.

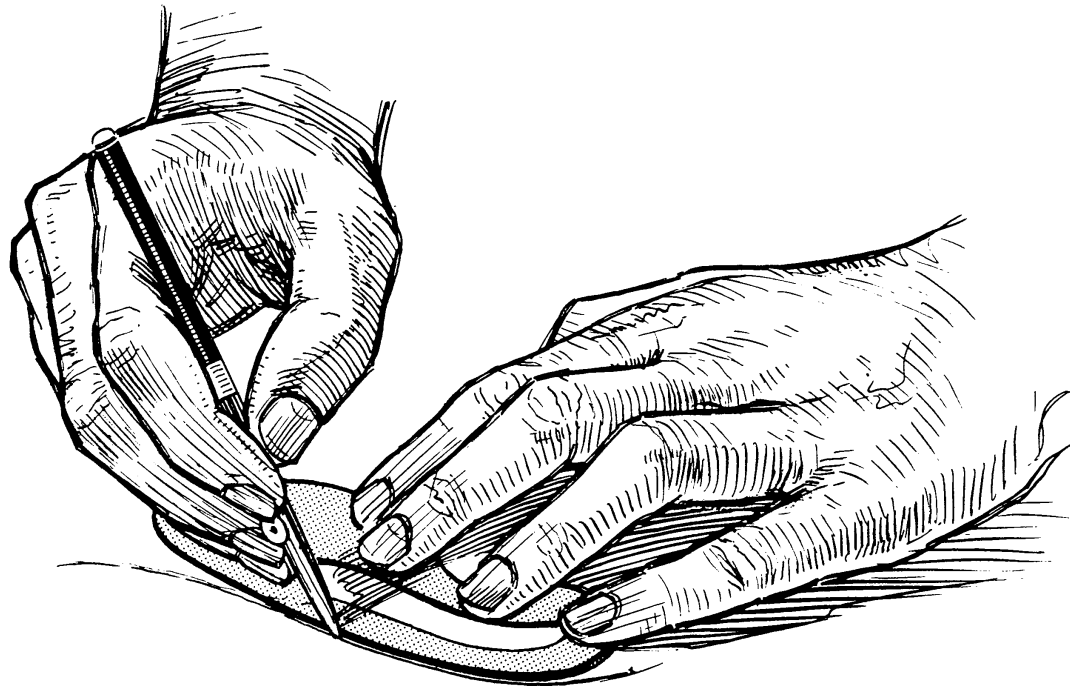


Figure 3-52
Using the Irregular Curves.

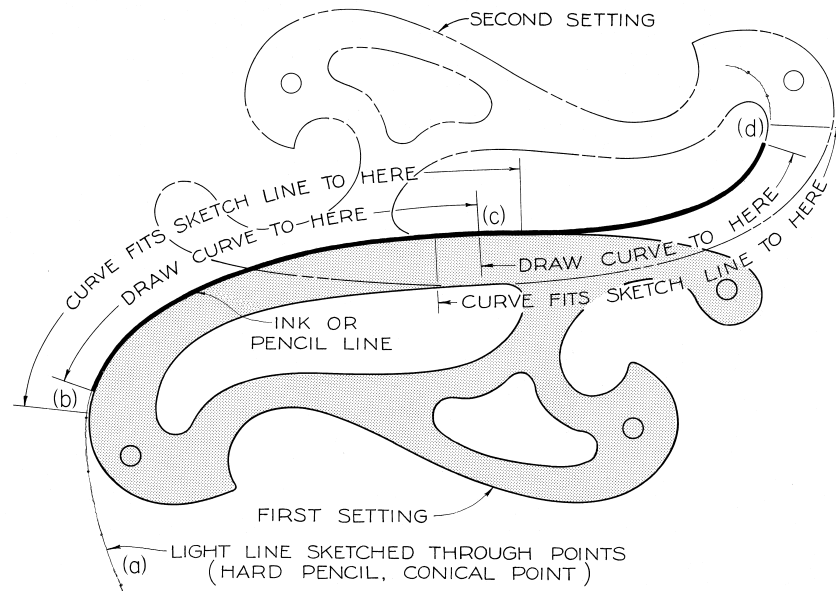


Figure 3-53
Settings of Irregular Curve.

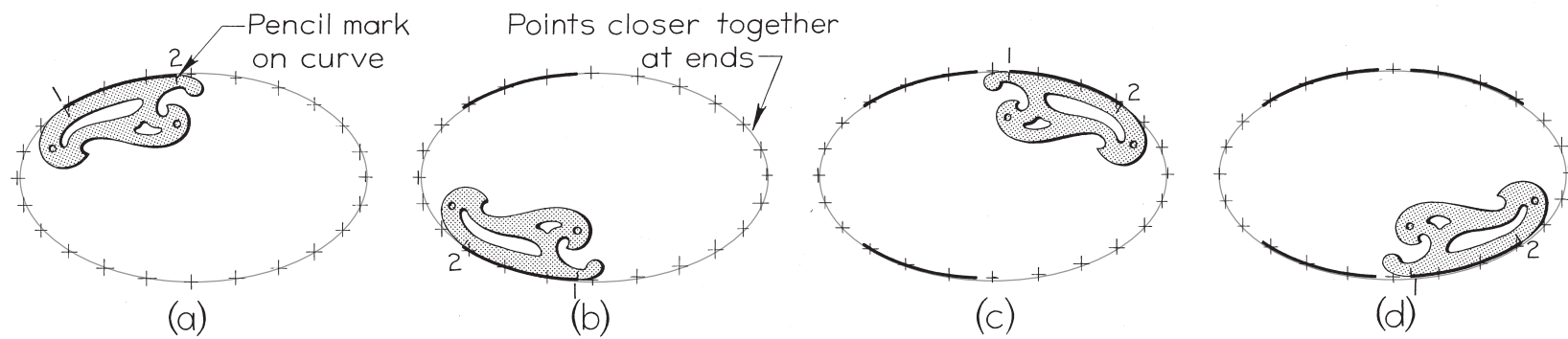


Figure 3-54
Symmetrical Figures.

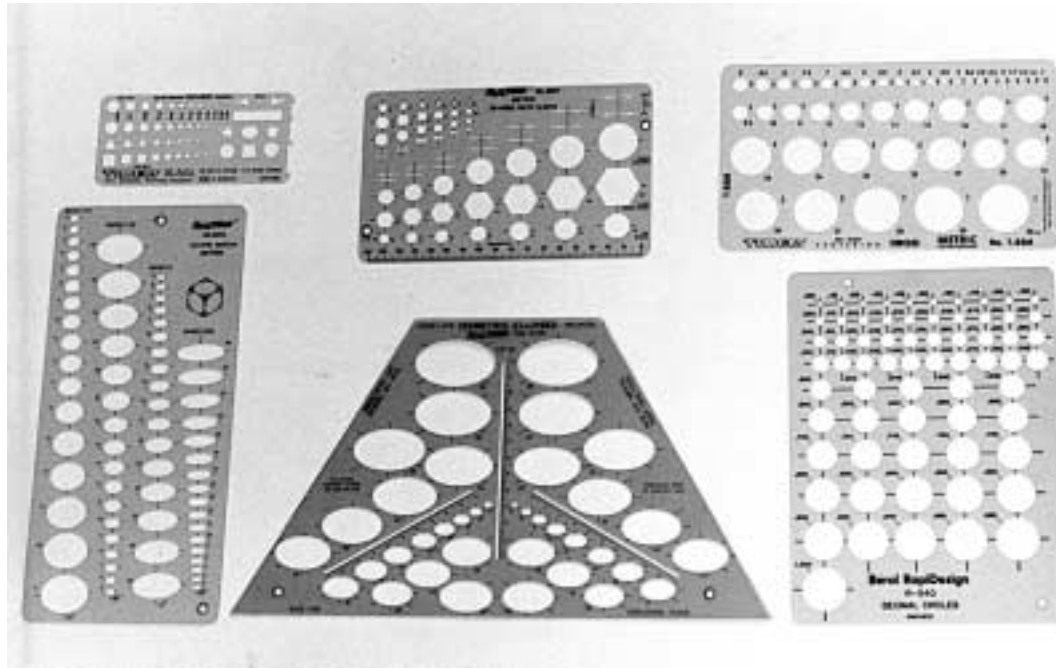


Figure 3-55
Templates.



Figure 3-56

Drafting Machine. *Courtesy of VEMCO Corporation.*



Figure 3-57

Adjustable Drafting Table with Track Drafting Machine. *Courtesy of Keuffel & Esser Co.*

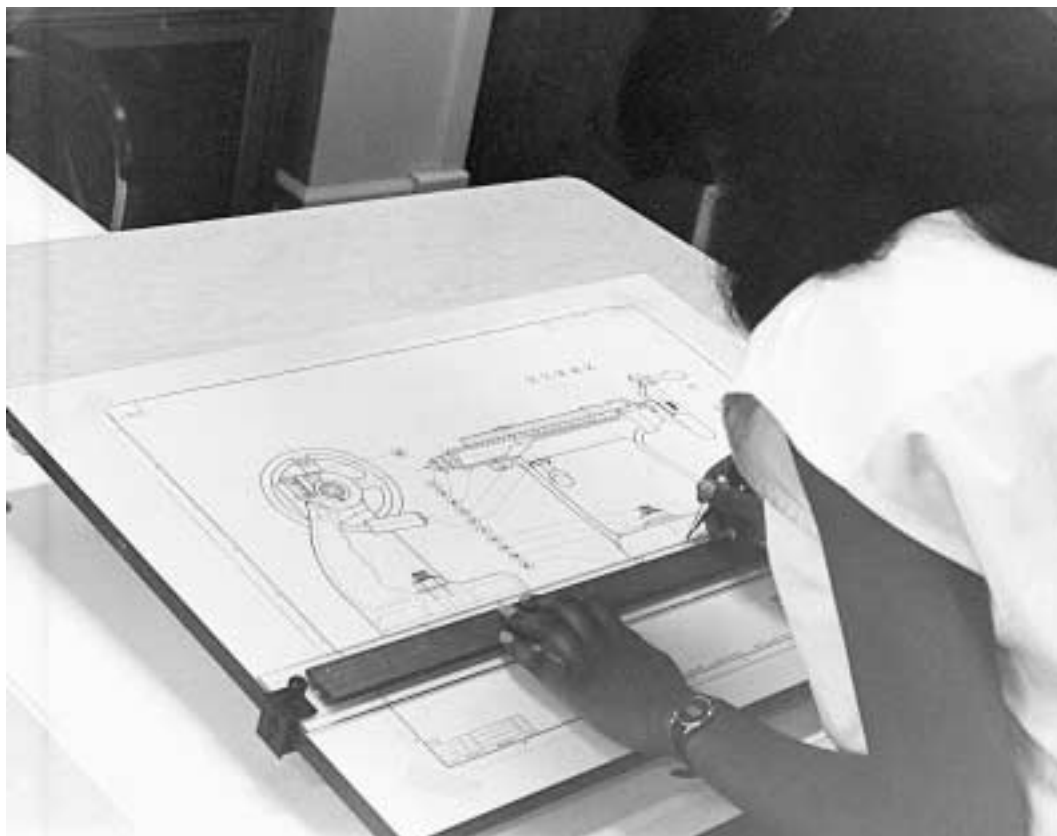


Figure 3-58
Parallel-Ruling Straightedge.

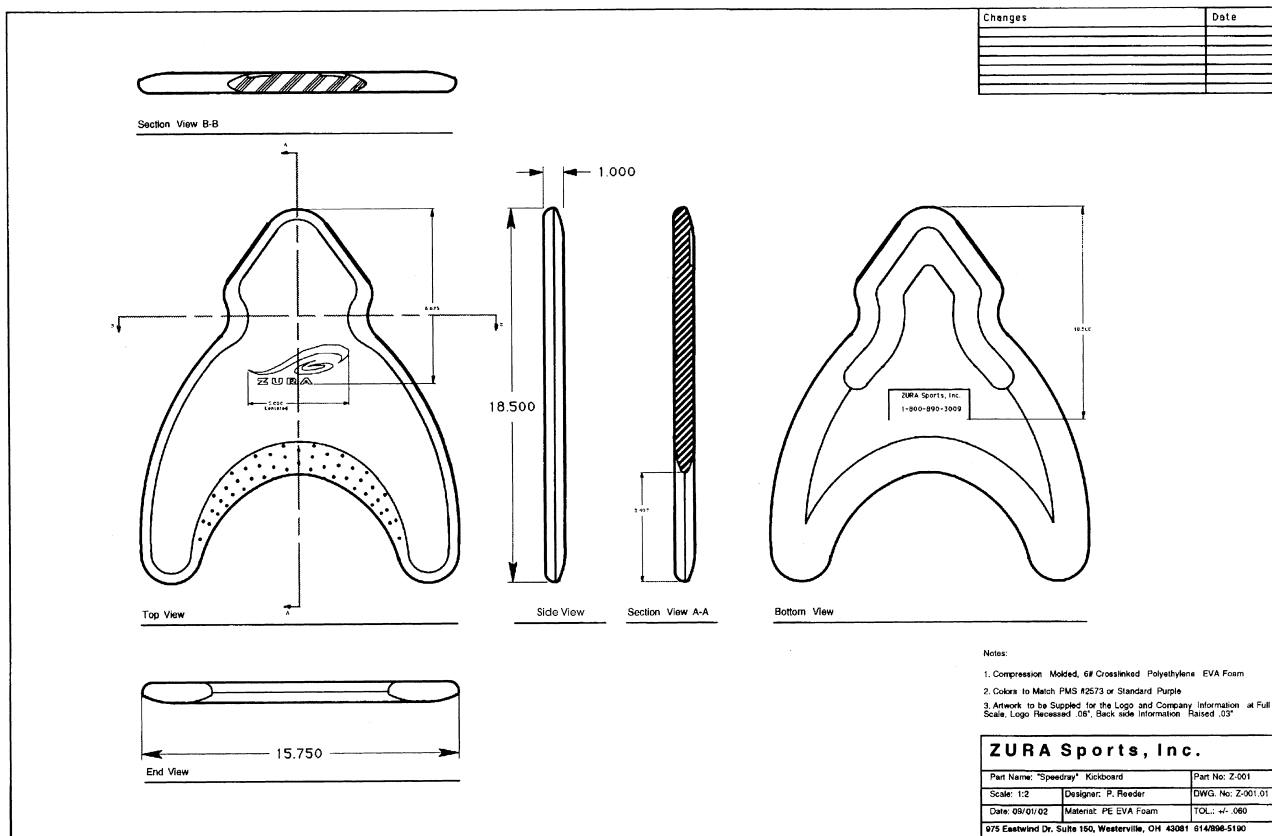


Figure 3-59

A Drawing Created Using CAD. *Courtesy of Zura Sports, Inc.*

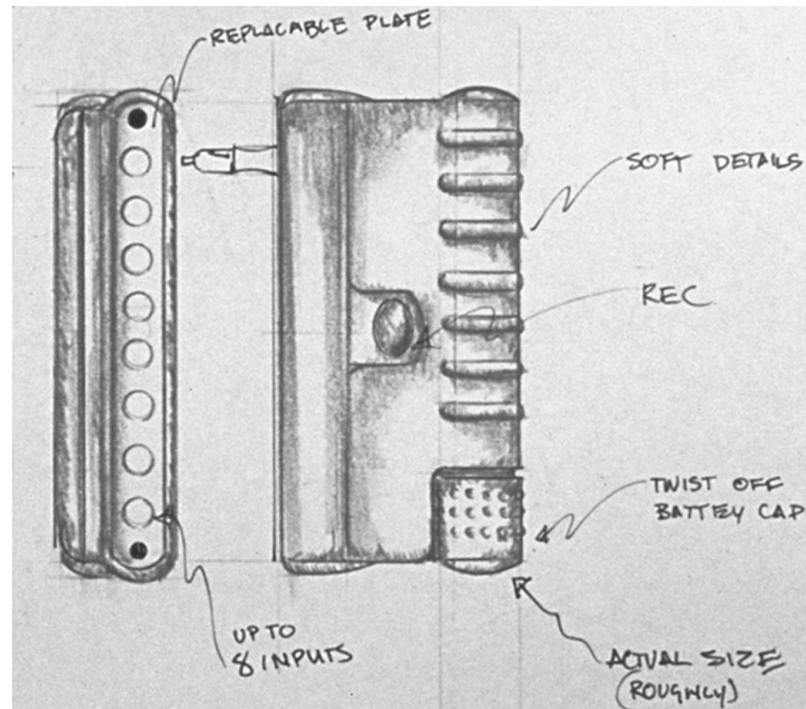


Figure 3-60

Great Ideas Often Start as Freehand Sketches Made on Scratch Paper. *Courtesy of ANATech, Inc.*

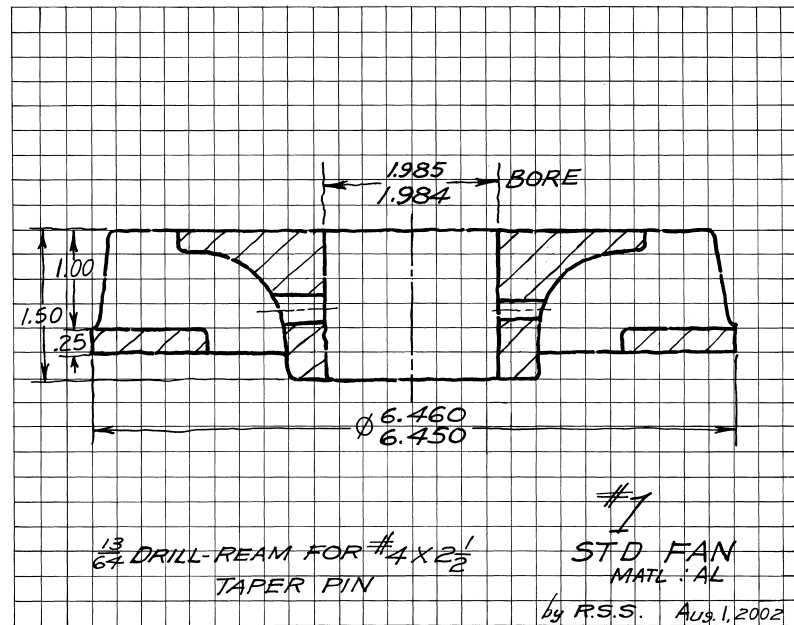


Figure 3-61
Sketch on Graph Paper.

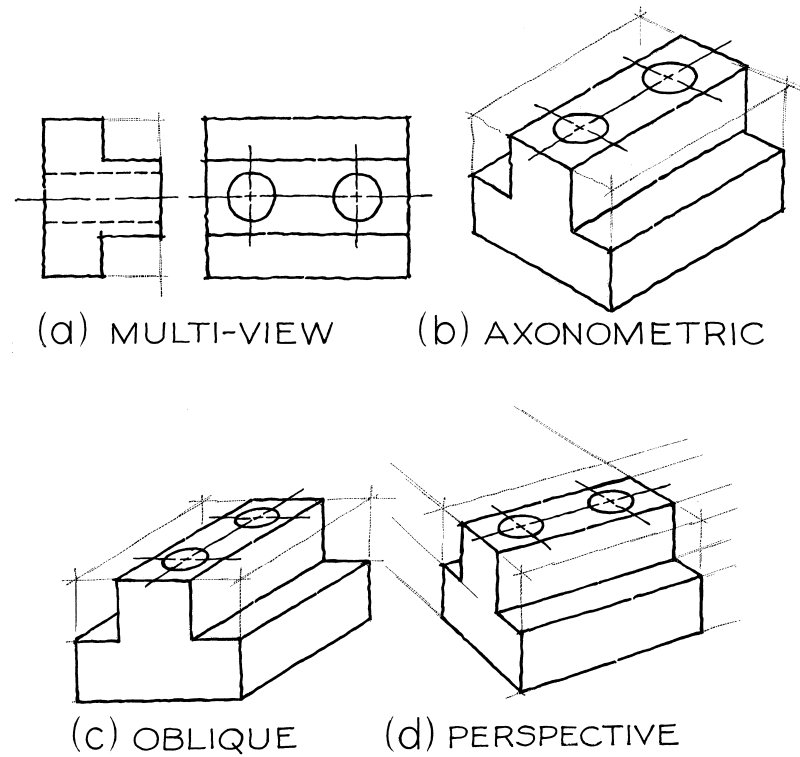


Figure 3-62
Types of Projection.

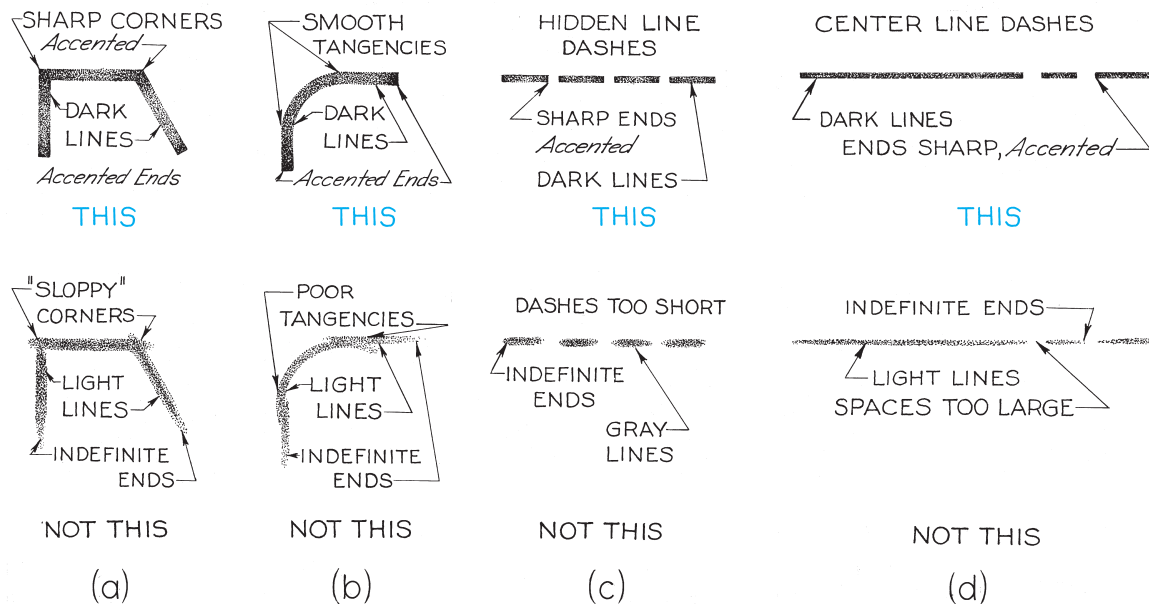


Figure 3-63
Technique of Lines (Enlarged).

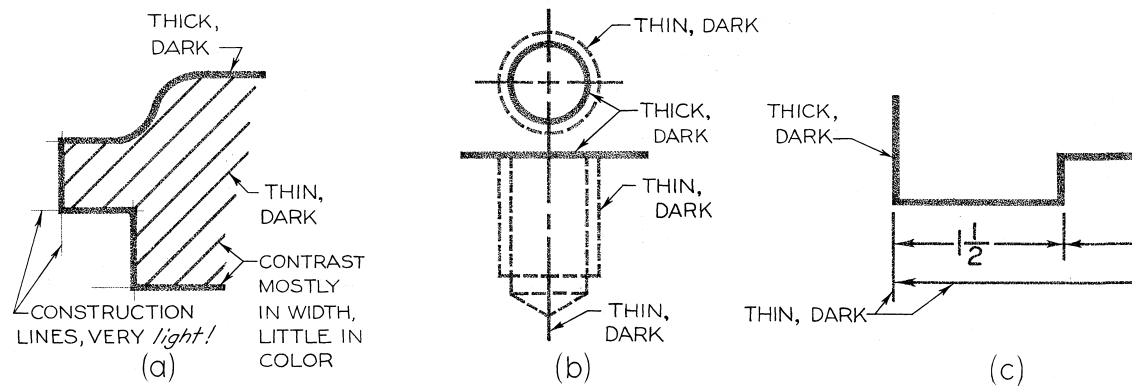


Figure 3-64
Contrast of Lines (Enlarged).



Figure 3-65
Circle Viewed as an Ellipse.

<p> A B C D E F G H a b c d e f g h i j </p> <p> A B C D E F G H I a b c d e f g h i j k l m </p>	<p> <i>Roman</i> All letters having elementary strokes "accented" or consisting of heavy and light lines, are classified as Roman. </p> <p> <i>Italic</i> All slanting letters are classified as Italics. These may be further designated as Roman-Italics, Gothic Italics or Text Italic. </p>
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Figure 3-66
Serif and Sans-Serif Lettering.

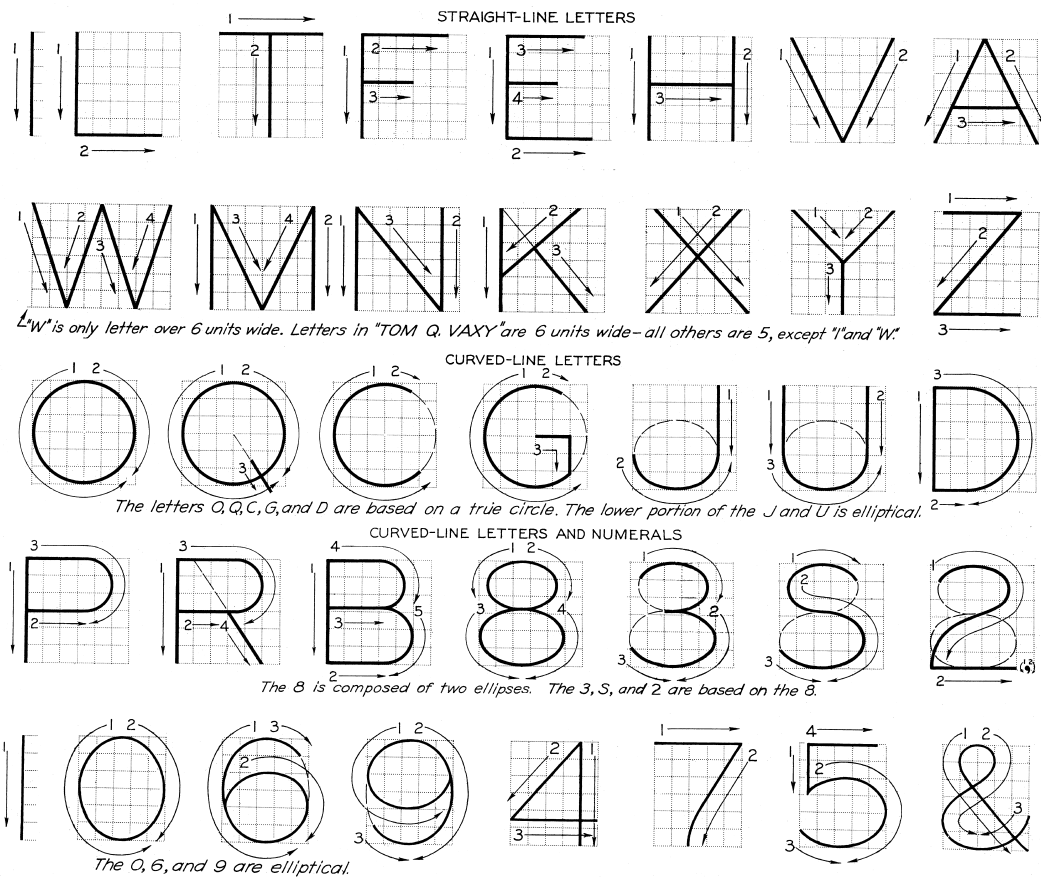


Figure 3-67

Vertical Capital Letters and Numerals.

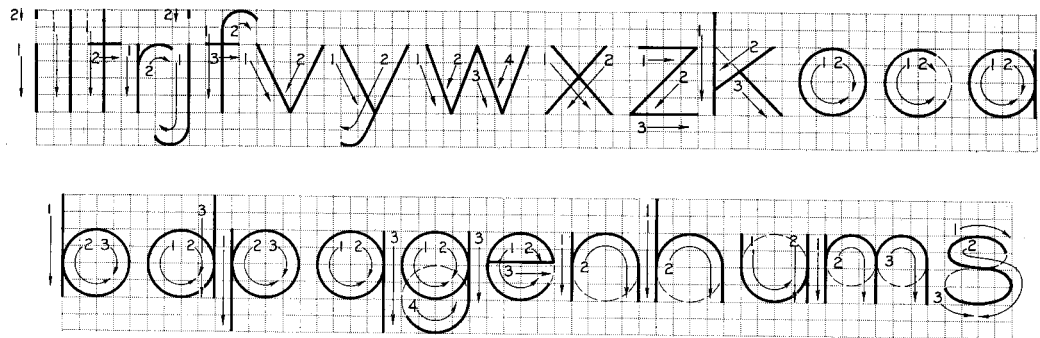


Figure 3-68
Vertical Lowercase Letters.



Figure 3-69
Inclined Capital Letters and Numerals.



Figure 3-70
Inclined Lowercase Letters.

THE IMPORTANCE OF GOOD LETTERING CANNOT BE
OVER-EMPHASIZED. THE LETTERING CAN MAKE OR
BREAK AN OTHERWISE GOOD DRAWING.

*PENCIL LETTERING SHOULD BE DONE WITH A FAIRLY
SOFT SHARP PENCIL AND SHOULD BE CLEAN-CUT
AND DARK. ACCENT THE ENDS OF THE STROKES.*

Figure 3-71
Pencil Lettering (Full Size).

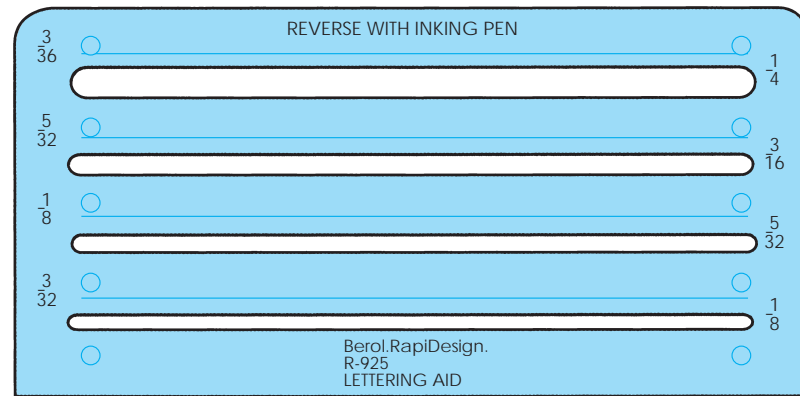


Figure 3-72

The Berol RapideDesign 925 Template is Used to Quickly Create Guidelines for Lettering.

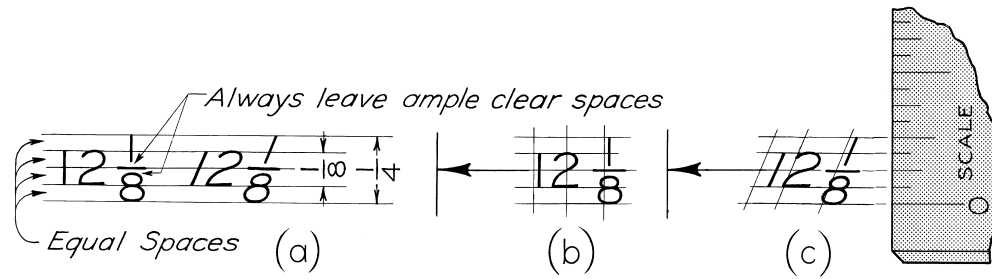


Figure 3-73
Guide Lines for Dimension Figures.

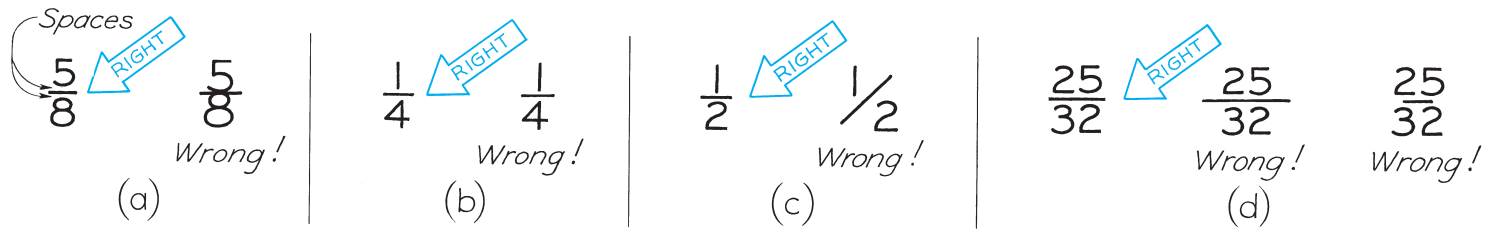


Figure 3-74
Common Errors.

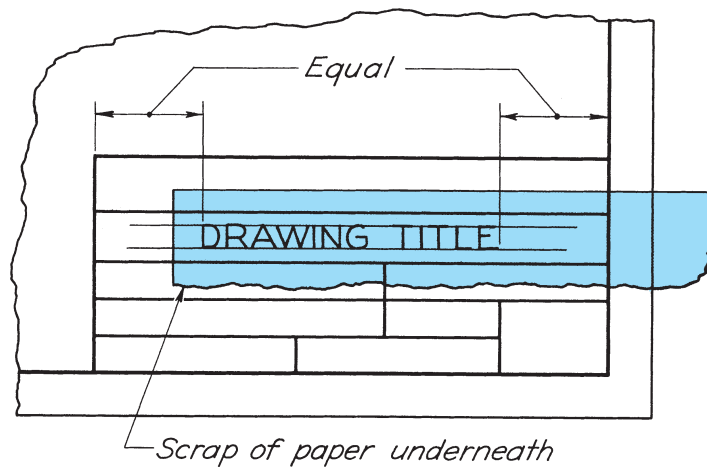


Figure 3-75
Centering Title in Title Box.

TOOL GRINDING MACHINE
TOOL REST SLIDE
SCALE : FULL SIZE
AMERICAN MACHINE COMPANY
NEW YORK CITY

DRAWN BY _____ CHECKED BY _____

Figure 3-76

Balanced Machine-Drawing Title.

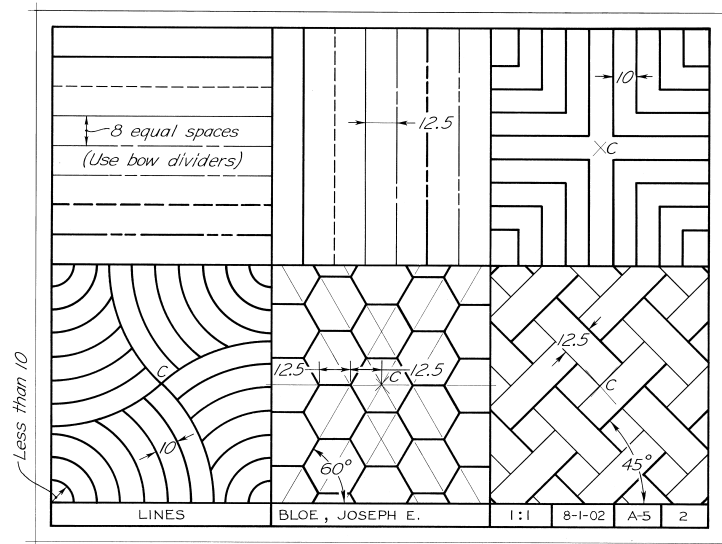


Figure 3-78

Using Layout A-2 or A4-3 (adjusted), divide working space into six equal rectangles, and draw lines as shown. In first two spaces, draw conventional lines to match those in Fig. 3.9. In remaining spaces, locate centers C by diagonals, and then work constructions out from them. Omit the metric dimensions and instructional notes.

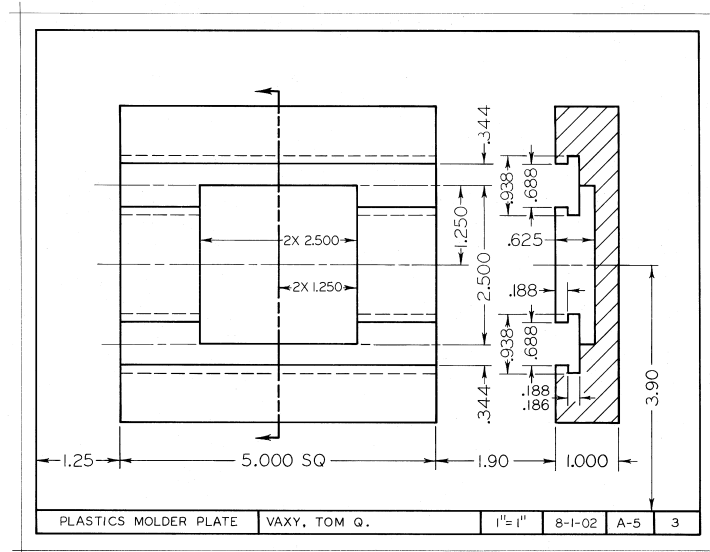


Figure 3-79

Using Layout A-2 or A4-2 (adjusted), draw views in pencil as shown. Omit all dimensions.

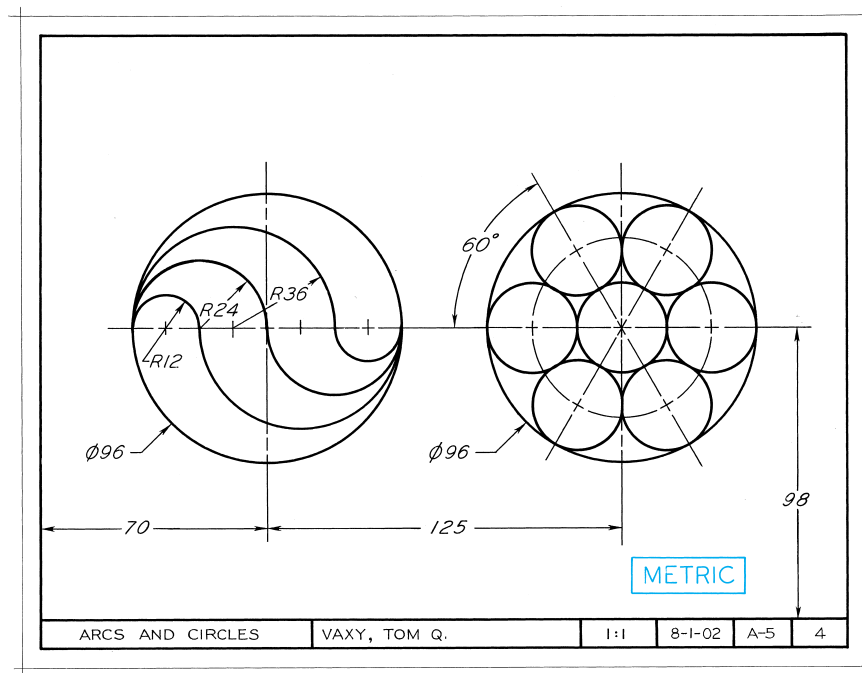


Figure 3-80

Using Layout A-2 or A4-3 (adjusted), draw figures in pencil as shown. Use bow pencil for all arcs and circles within its radius range. Omit all dimensions.

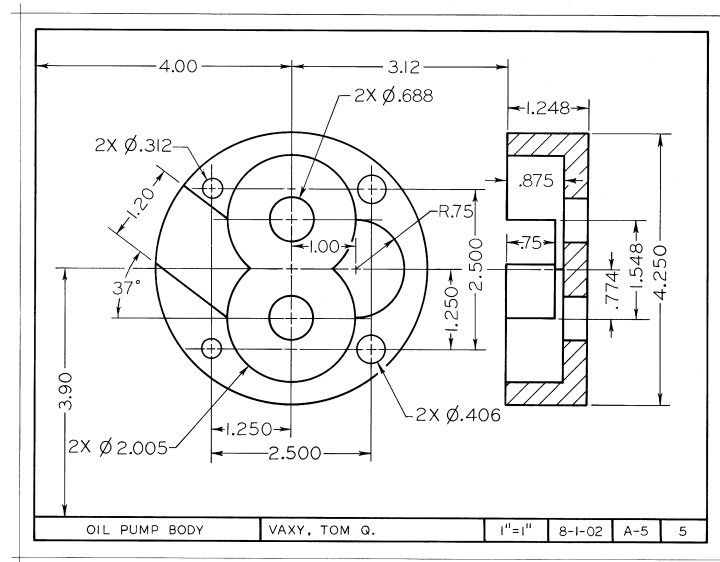


Figure 3.81

Using Layout A-2 or A4-2 (adjusted), draw views in pencil as shown. Use bow pencil for all arcs and circles within its radius range. Omit all dimensions.

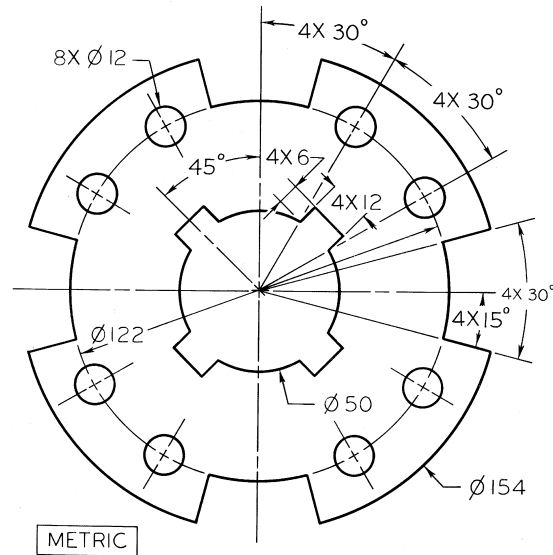


Figure 3-82

Friction Plate. Using Layout A-2 or A4-2
(adjusted), draw in pencil. Omit dimensions and notes.

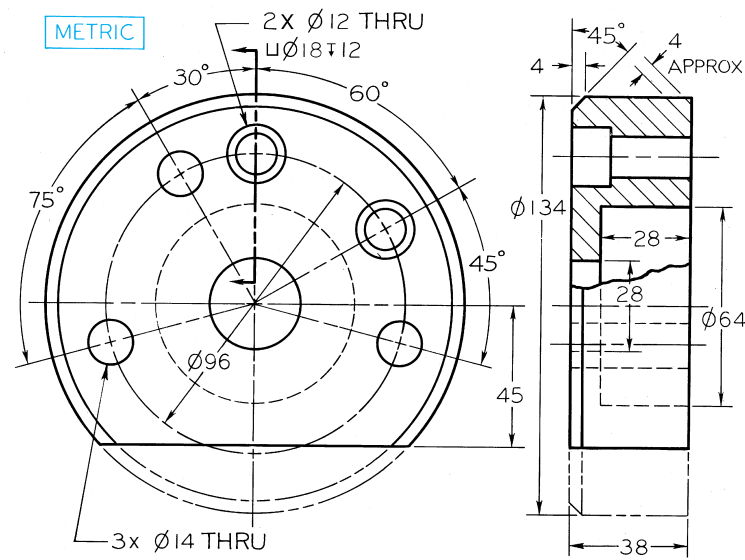


Figure 3-83

Seal Cover. Using Layout A-2 or A4-2 (adjusted), draw in pencil. Omit dimensions and notes.

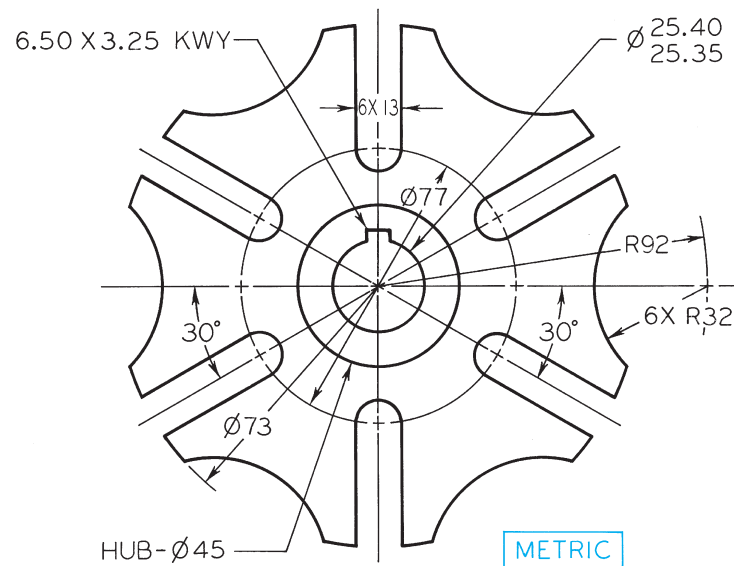


Figure 3-84

Geneva Cam. Using Layout A-2 or A4-2
(adjusted), draw in pencil. Omit dimensions and notes.

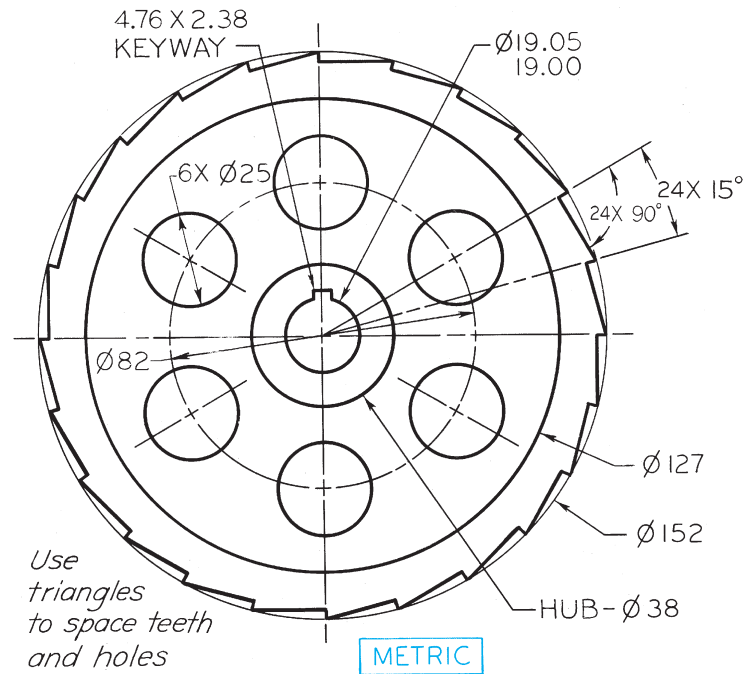


Figure 3-85

Ratchet Wheel. Using Layout A-2 or A4-2 (adjusted), draw in pencil. Omit dimensions and notes.

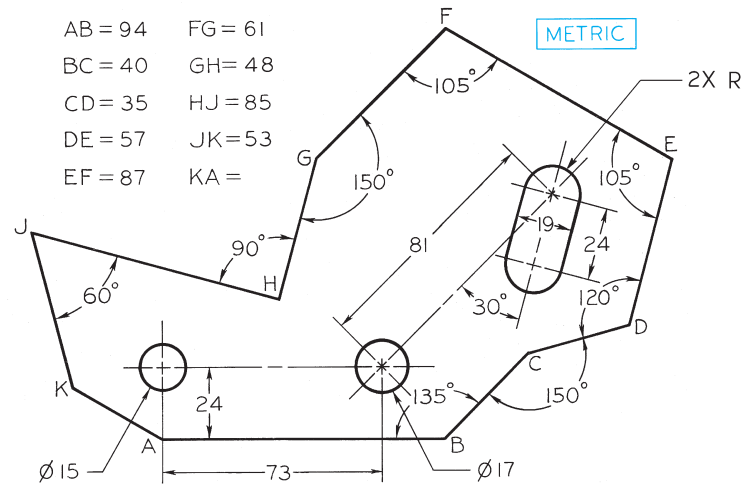


Figure 3-86

Shear Plate. Using Layout A-2 or A4-2 (adjusted), draw accurately in pencil. Give length of KA. Omit other dimensions and notes.

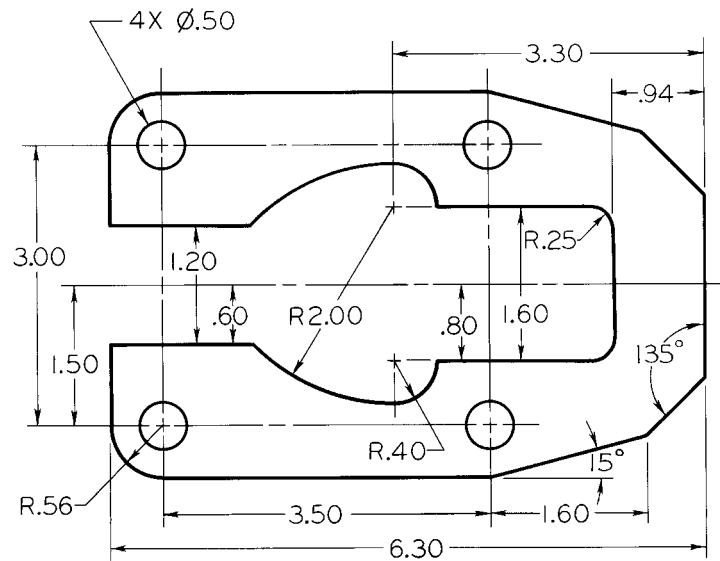


Figure 3-87

Latch Plate. Using Layout A-2 or A4-2 (adjusted), draw in pencil. Omit dimensions and notes.

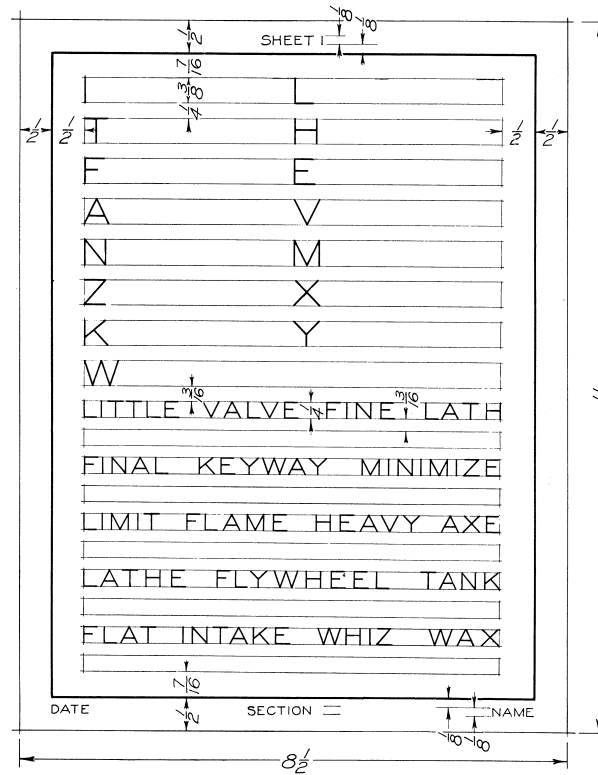


Figure 3-88

Prob. 3.12.

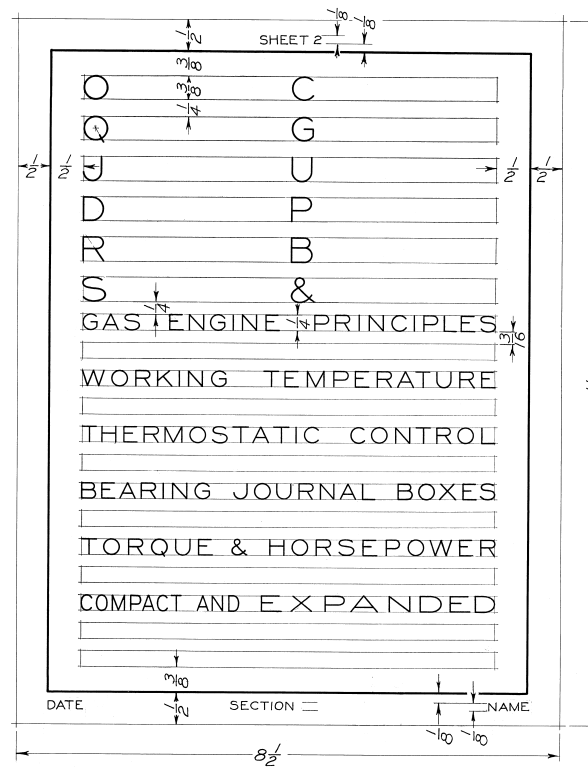


Figure 3-89

Prob. 3.13.

Prob. 3.14.

