

Engineering Drawing Lecture 7



*TO DRAW the Views of a line
given the true length , slope,
and Bearing.*

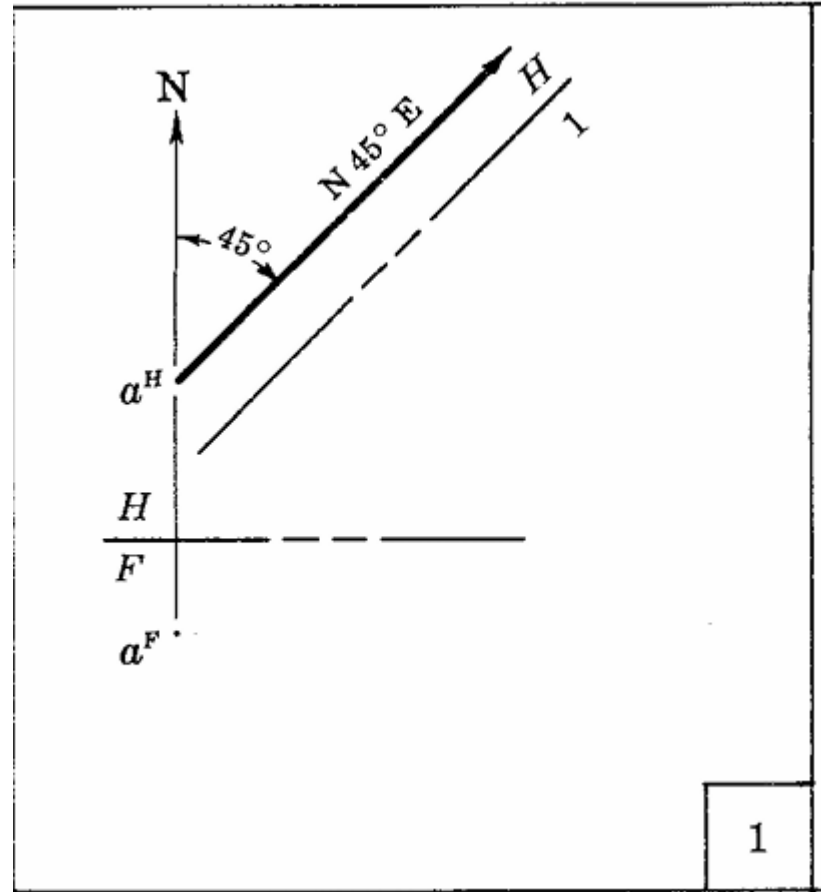
To DRAW the VIEWS of a LINE GIVEN the TRUE LENGTH, SLOPE, and BEARING.

- It should be remembered that bearing can only be shown on the plan view and that the direction of north is always assumed to be toward the top of the drawing sheet.

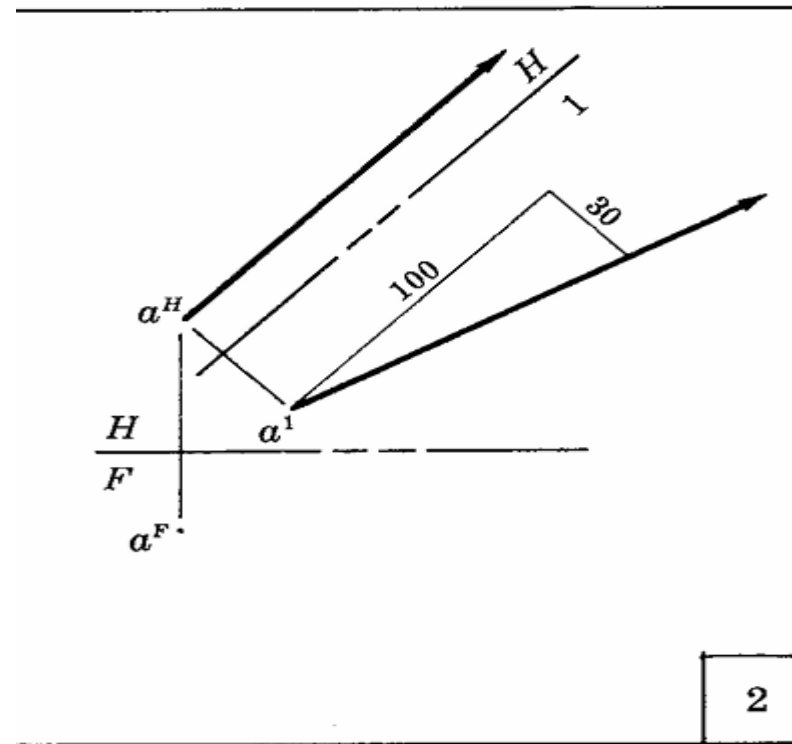
Example: Line AB bears N 45° E, is 420' long and has a downward grade of 30% from A to B.

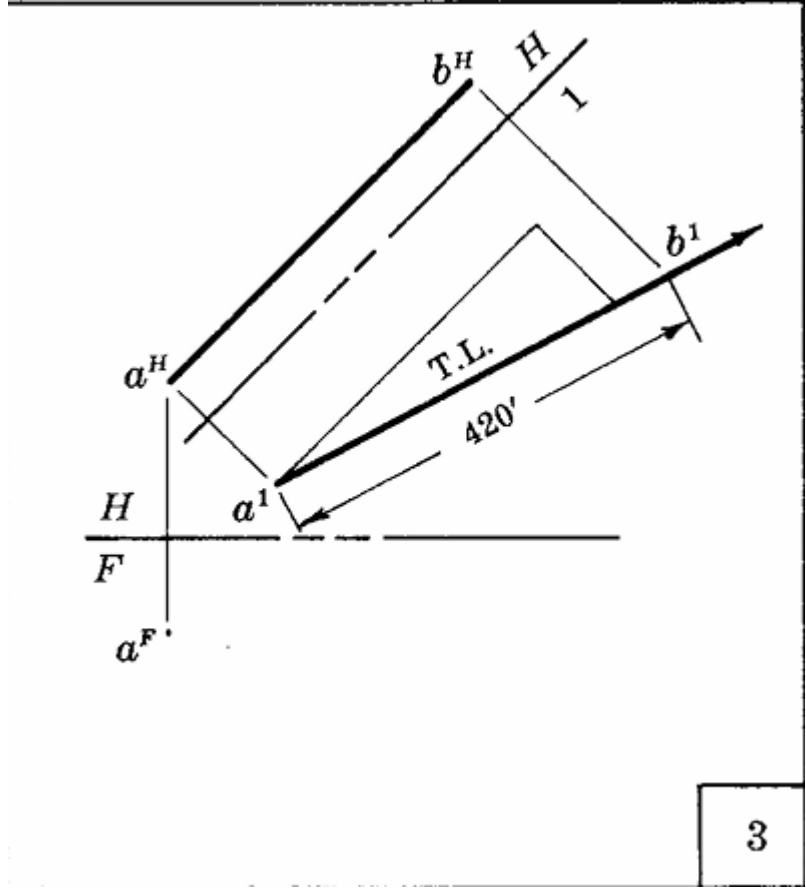
Construct the plan and front elevation views of the line. Fig. below

Step 1: Establish point A in both the plan and front views. From point A in the plan view, draw a line having a bearing of N 45° E. This line is of an indefinite length. Construct a folding line H-l parallel to the bearing line



Step 2: Locate point A in the auxiliary elevation view, placing it the same distance away from the folding line as it is in the front view. From point A in view 1, draw a light line parallel to H-l and measure off 100 units using any convenient scale. Measure a perpendicular distance of 30 units to locate a point on a line established as downward grade. This line is also indefinite in length. (If the slope angle is given instead of the per cent grade, then a protractor should be used to layout the angle.)



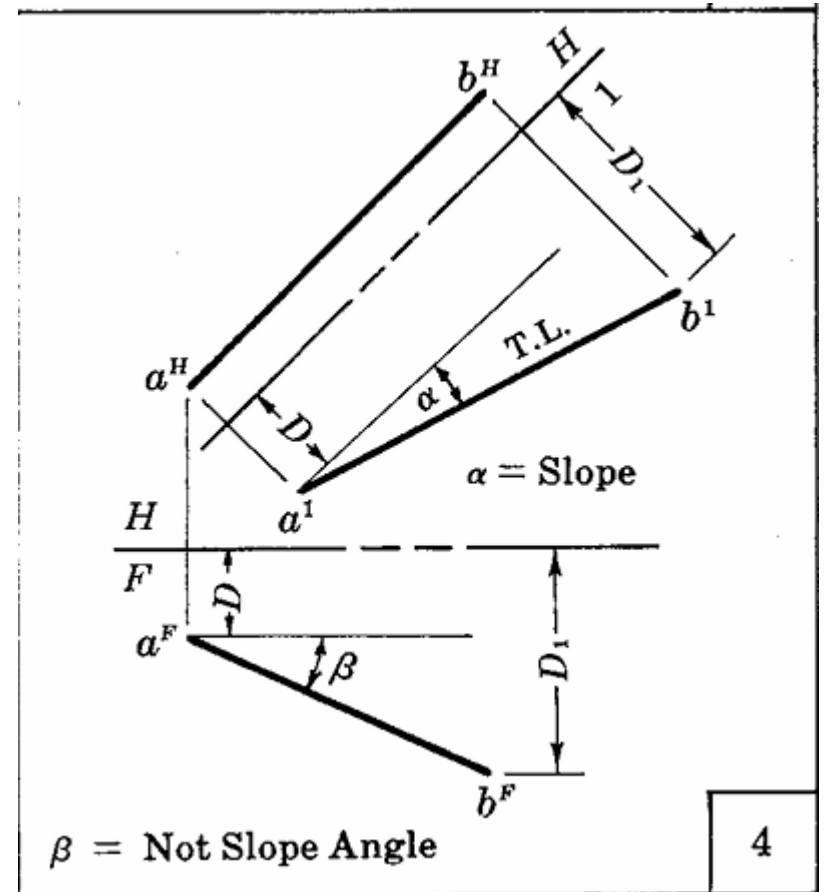


Step 4: To locate point B in the front view, project from the plan view down to the front view

and step off the same distances for point B in the front view as we have on the auxiliary elevation view1.

Similar points on all elevation views will be the same distance below the horizontal image plane.

Note : Remember that in order to see the slope or grade of a line, the line must appear in its true length in an elevation view.



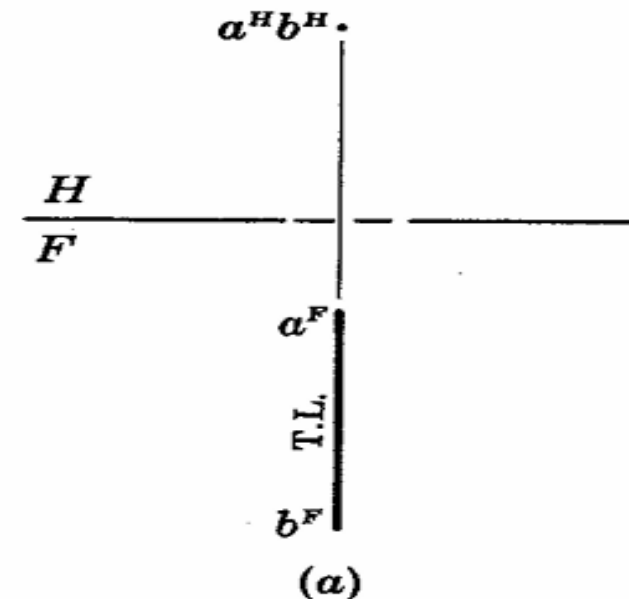
The STRAIGHT LINE APPEARING as a POINT :

Analysis:

- A line will appear as a point in any view in which the lines of sight are parallel to the line in space
- . The line must first appear in its true length in the view adjacent to that which shows it as a point.

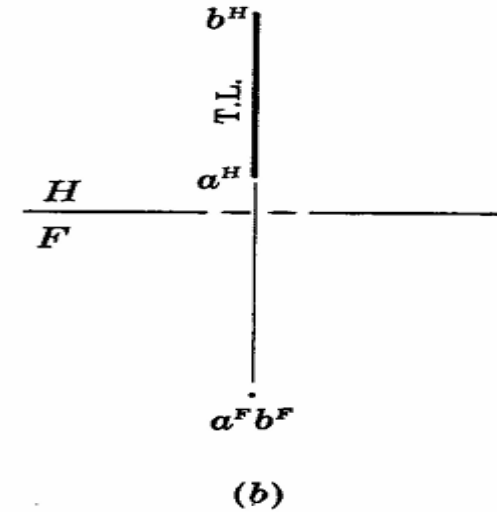
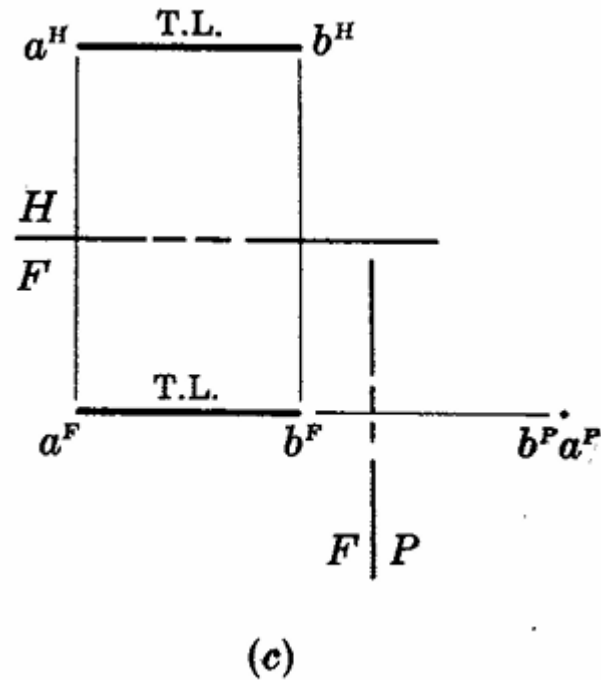
Example: In Figures below

(a) A vertical line projects as a point in the plan view;



At b a level line projects as a point in the front elevation view;

at (c) line AB is a level line appearing as a point in the Profile view.



The figure 2- 21 shows an oblique line which requires four views to show it as a point.

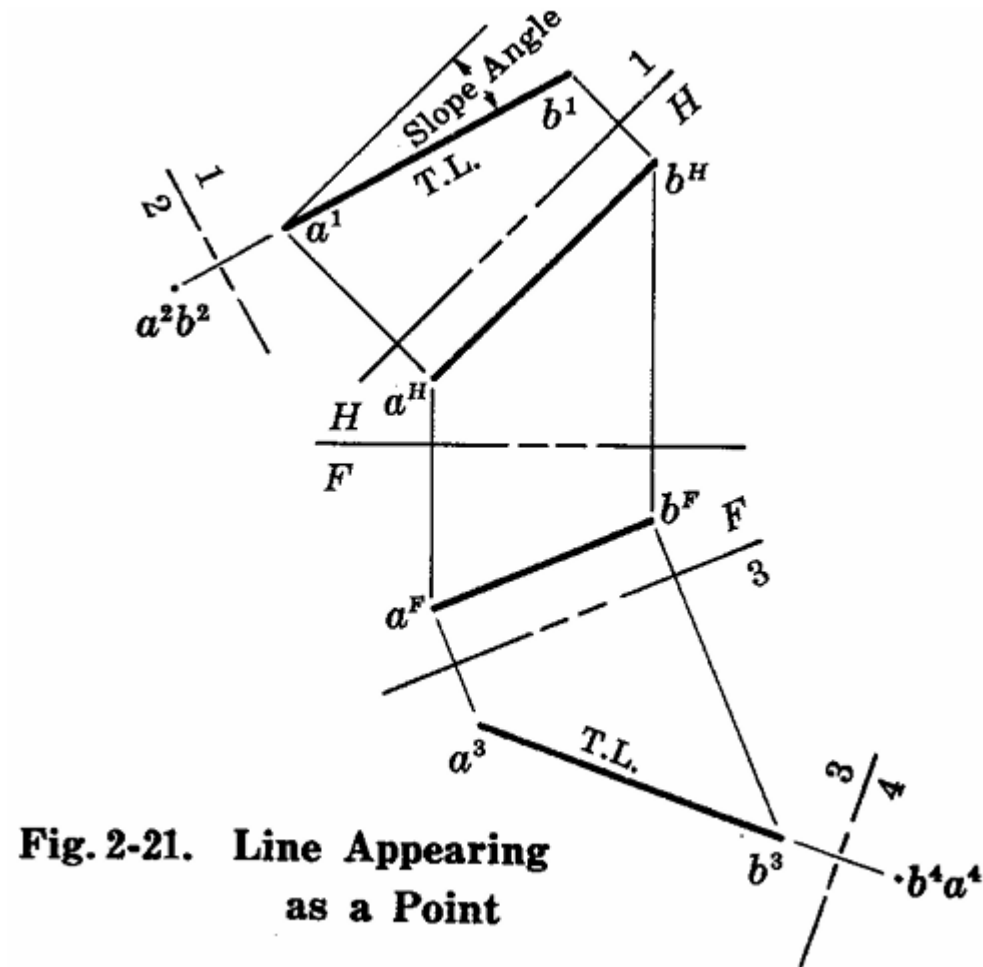


Fig. 2-21. Line Appearing as a Point

- The first step in determining the point view of the line is to establish its true length.
- Then place the folding line perpendicular to the true length of the line.
- The resulting projection of the line is that of a point
- The true length view can either be an auxiliary elevation view projected from the plan or it may be an inclined view projected from the front view.

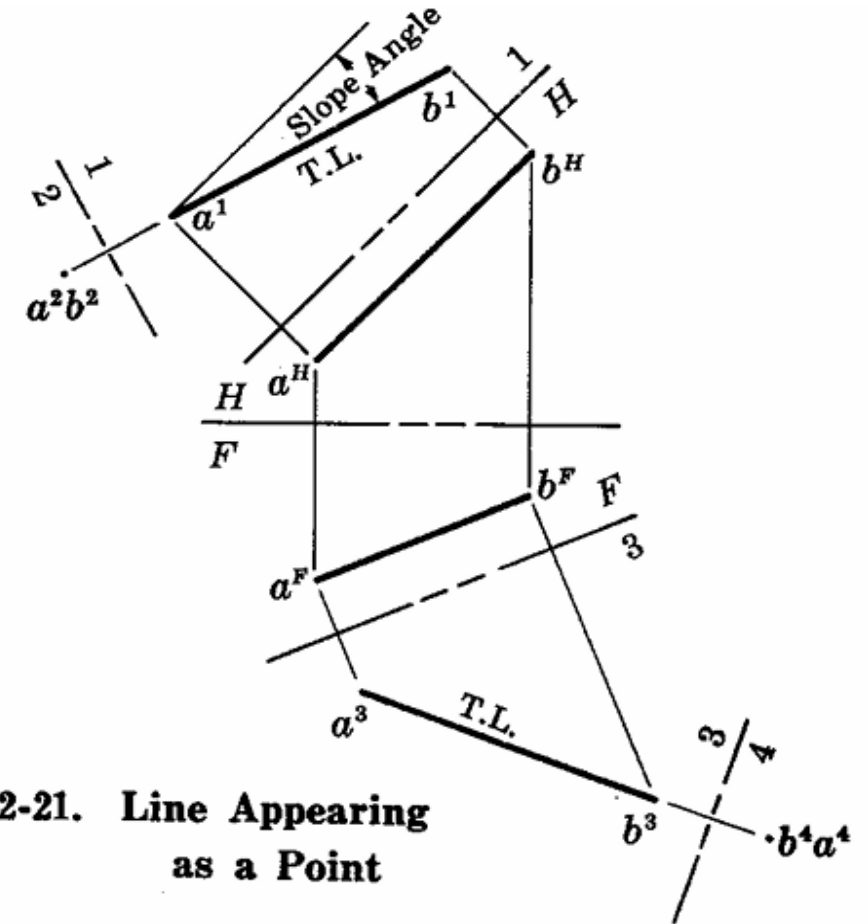


Fig. 2-21. Line Appearing as a Point

- The advantage of showing the true length in an auxiliary elevation view is that of being able to show the slope of the line in the same view if it is required.
- As mentioned before, the inclined view 3 cannot show the slope of the line because a horizontal plane does not appear as an edge in this view and slope must be measured from a horizontal base line.

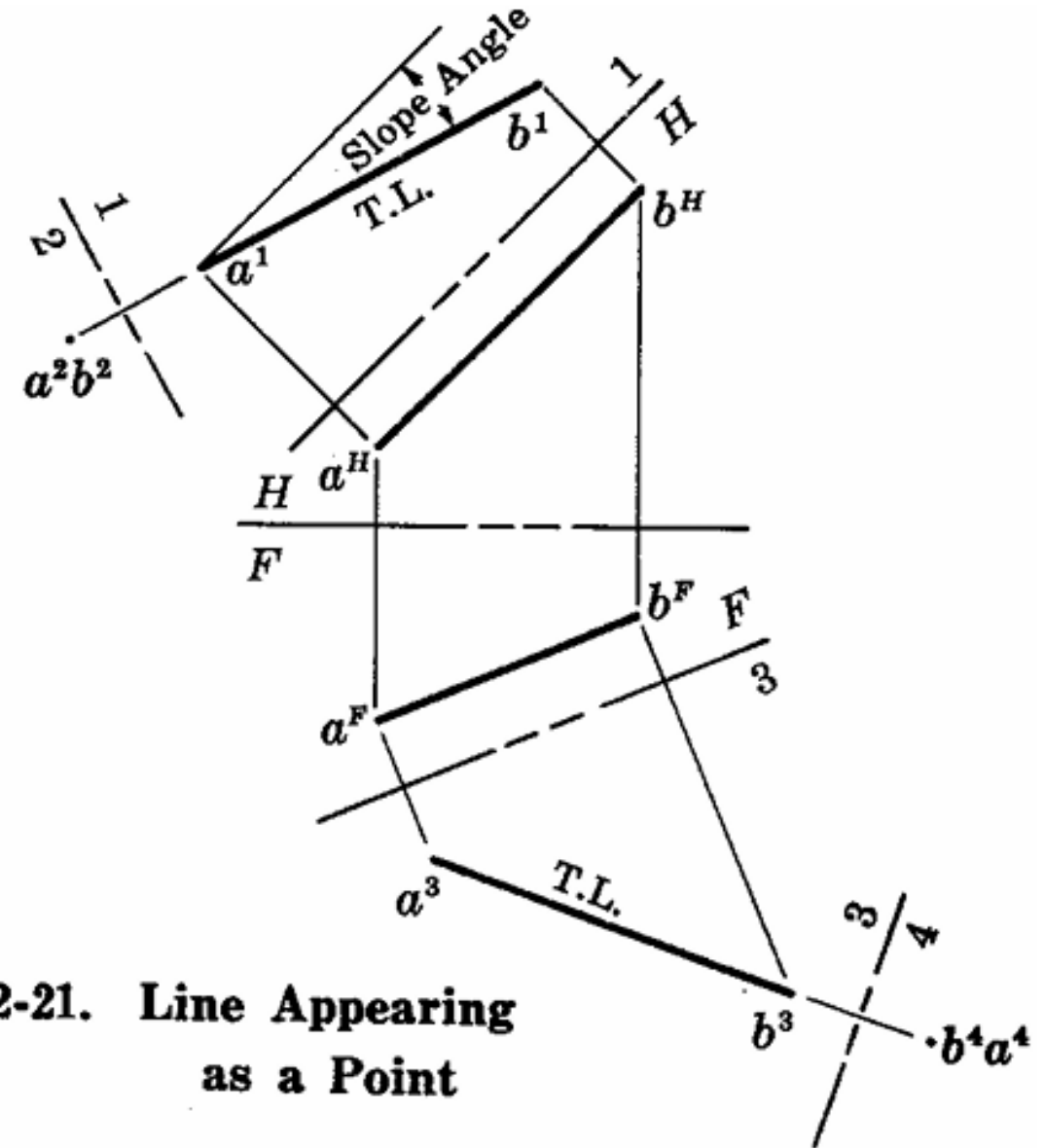


Fig. 2-21. Line Appearing as a Point

The PLANE APPEARING as an EDGE :

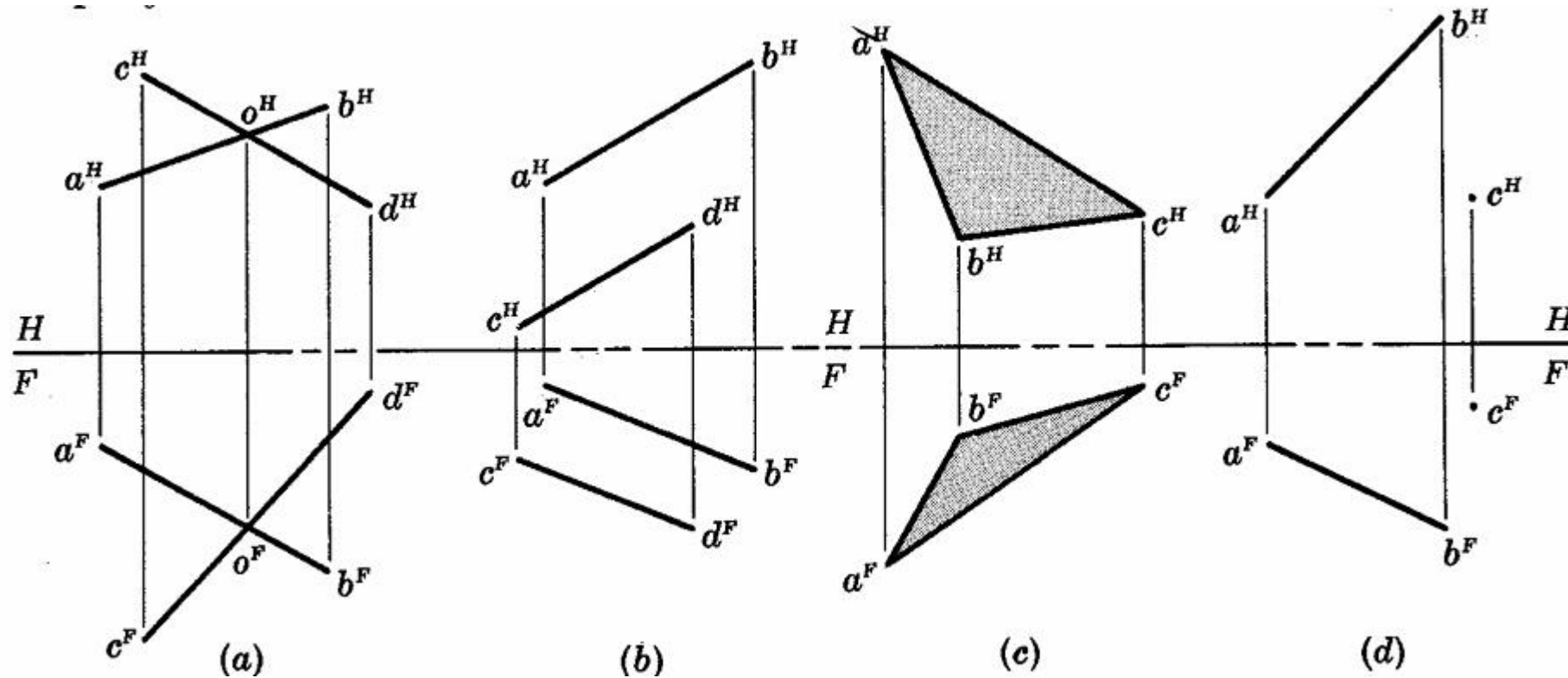
**any two lines in a plane will either
be parallel or will intersect.**

Planes not perpendicular to any of the three principal planes of projection are called oblique planes.

In general engineering practice, there are four ways of representing a plane in Multiview drawing. The problems can be solved by using any or all of these plane representations.

below the four representations of planes are shown as follows:

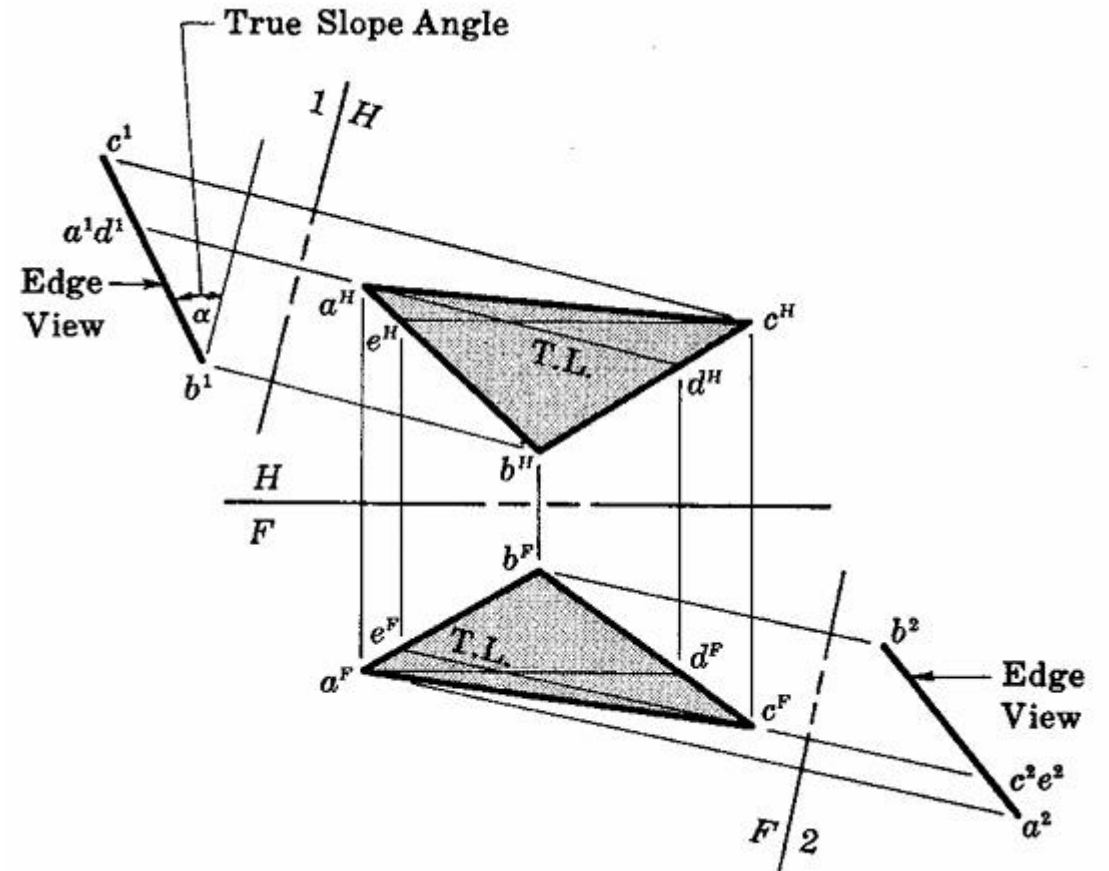
(a) Two intersecting lines", (b) Two parallel lines, (c) Three points not in a straight line, and (d) A point and a line.



Analysis:

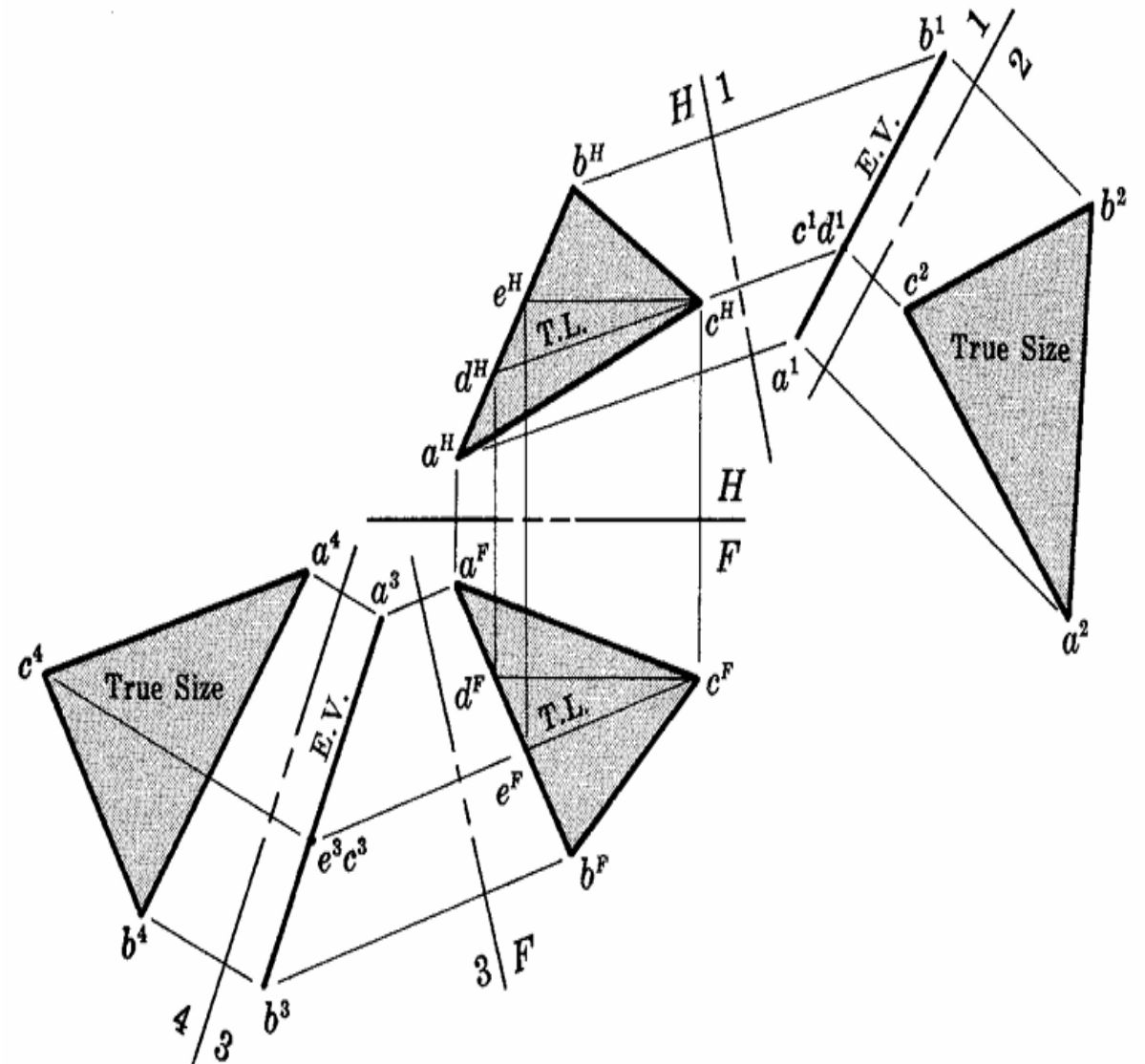
- (1) The edge view of a plane should never be visualized as being a line but rather as a plane in which points are located at varying distances from the observer. .**
- (2) The method of showing an oblique plane as an edge is that of drawing an auxiliary view with lines of sight parallel to a horizontal, frontal, or profile line on the plane.**
- (3) The line on the plane must first appear in its true length.**
- (4) Any plane will appear as an edge, or straight line, in that view which shows any line in that plane as a point.**

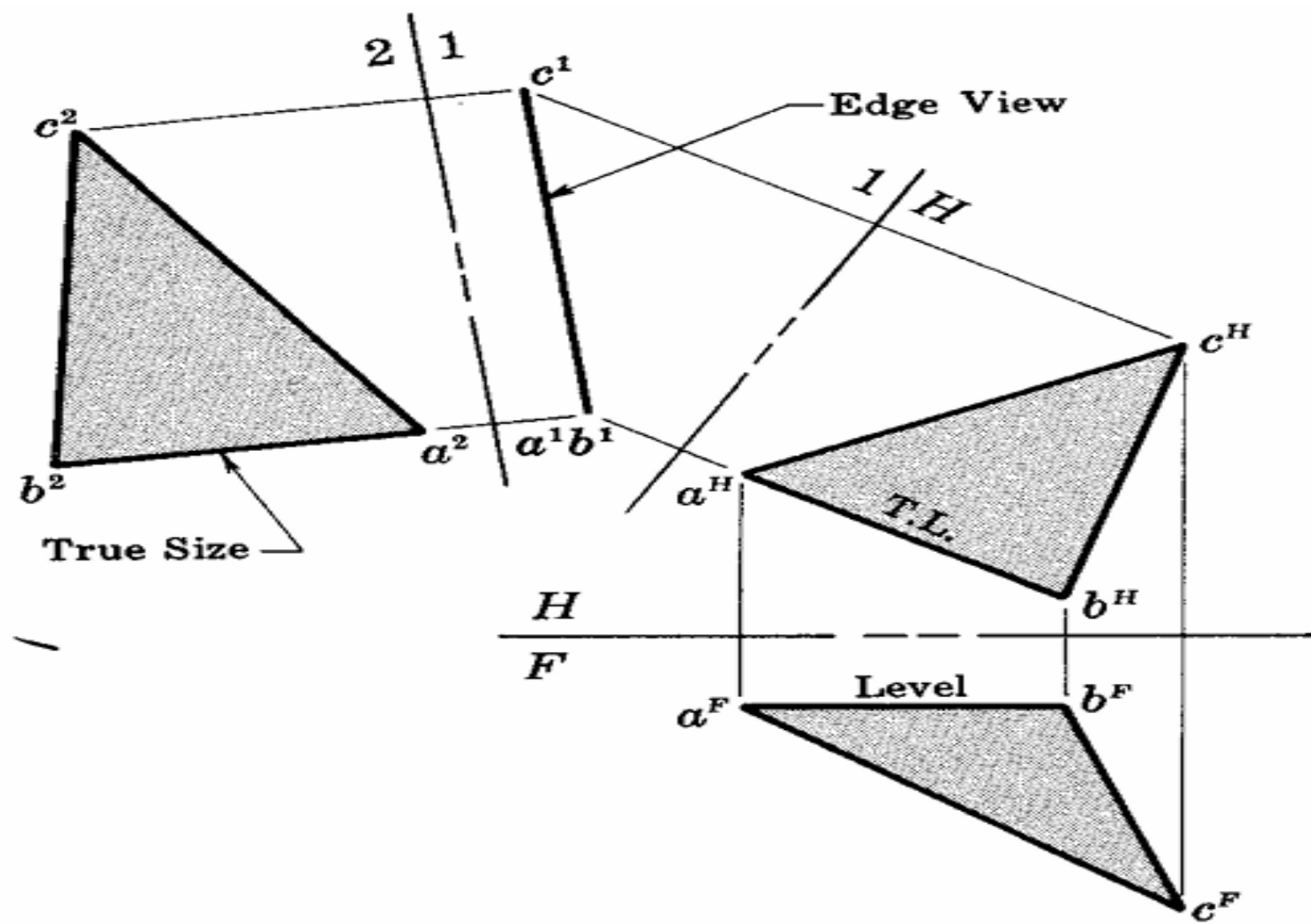
Example: To obtain the edge view of plane ABC in Fig., draw a level line AD in the front view. Project to the plan view where the level line will now appear in its true length. Locate the folding line H-l perpendicular to the true length line. Project the points from the plan view to the auxiliary elevation view. The true length line in the plan view now appears as a point. Project also points B and C in the auxiliary view. The straight line joining these two points (and the point view of line AD) determines the edge view of plane ABC.



The PLANE APPEARING in its TRUE SIZE and SHAPE :

Example: To obtain the true size of plane ABC as shown in Fig., the first step would be to show a true length line on the plane. This can be done by either drawing a frontal line CE in the plan view or a level line CD in the front view. The auxiliary elevation view 1 will show the level line as a point and, thus, the plane appears as an edge. The inclined view 2 shows the true size of the plane.





THANK YOU