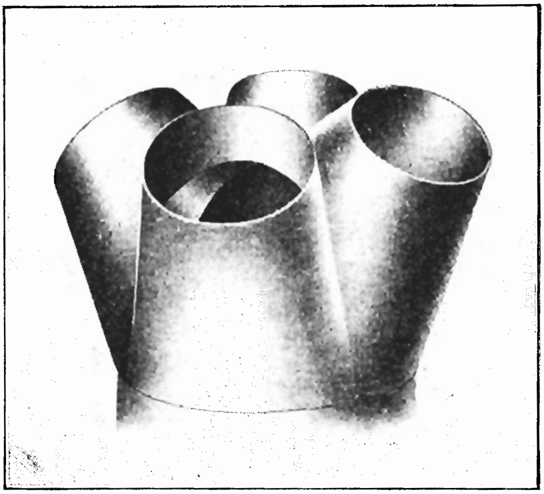
CHAPTER XXVI.

On a Fitting With any Number of Prongs.

In foregoing chapters methods have been suggested which enable us to reduce the development of patterns for a two pronged fitting to a comparatively simple operation. Here attention will be directed to the development of patterns for the branched fitting of three or



more prongs by utilizing the same form as was suggested in the last chapter.

For example, a form whose elevation is shown at Fig. 108, Chapter 25, was presumed to be cut away on line *E E*. With Fig. 108 before us it will be noted that the line *E E* is the elevation, and that the line *5 E* is the plan of a plane which cut said form. This plane then passes through the center of the circle which is a plan of the base of the fitting, thereby cutting said circle into two equal parts. If this form had been cut by a combination of planes whose plans included a sector of this circle equal to one-third of it, and properly placed, a portion of the original form could then have been utilized as one prong of a three pronged fitting.

Again, had these cutting planes been located in such positions as to allow their plans to include a sector of the circle which is a plan of the base of the fitting equal to

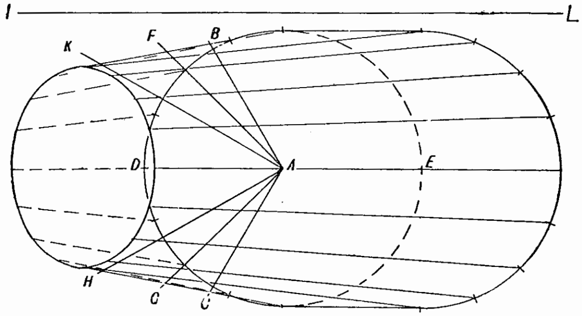


Fig. 110. *The Plan of an Object, a Portion of Which May Be Utilized as One Prong of a Fitting of a Considerable Number of Prongs.*

one-fourth of it, then a portion of the original form could be utilized as one prong of a four pronged fitting, and so on for any reasonable number of prongs.

That we may better understand the above, Fig. 110 has been drawn. This, as will be noted, is a complete plan of an object whose semi-plan and elevation has been shown in Fig. 108, Chapter 25. Here it has been assumed that the circle *C D B E* is a plan of the main stem of the required fitting, and the ellipse is a plan of the small end of one prong. The lines *A B* and *A C* have been drawn at angles of 60 degrees to line *A D,* or 120 degrees from each other, therefore the sector *A C D B* is one-third of the whole circle, and that portion of Fig.

110 to the left of lines *A B* and *A C* may be looked upon as the plan of one prong of a three pronged fitting.

The lines *A F* and *A G* have been drawn at an angle of 45 degrees to line *A D*, or 90 degrees from each other, thereby including a portion of the circle which represents the main stem of the fitting equal to one-fourth of the whole. Thus it will be noted that portions of Fig. 110 to the left of lines *A F* and *A G* may be looked upon as the plan of one prong of a four pronged fitting. By similar reasoning we may look upon that portion of Fig. 110 to the left of lines *A K* and *A H* as the plan of one prong of a six pronged fitting, although in this instance the original object should be made somewhat higher, since the lines *A K* and *A H* approach the ellipse or round collar at the top too closely for satisfactory results.

In this manner we assume those lines radiating from point *A* as *A B, A K,* etc., as the plans of planes which may be employed to cut the original object in such positions as to allow the use of the remaining portions of the object to be used as one prong of a fitting with a considerable number of prongs.

We will now proceed to develop the pattern for a four pronged fitting in accordance with the above analysis of the problem. However, since the line *D E,* Fig. 110, divides that diagram into equal parts, a semi-plan will fulfil every requirement and curtail our work to some extent.

The True Form of Section.

Fig. 111 shows a semi-plan and an elevation similar to that shown in Fig. 108, Chapter 25. Since the line *A G,* Fig. 110, is looked upon as the plan of a plane which cuts elements of the original form, we have only to determine the exact points at which those elements

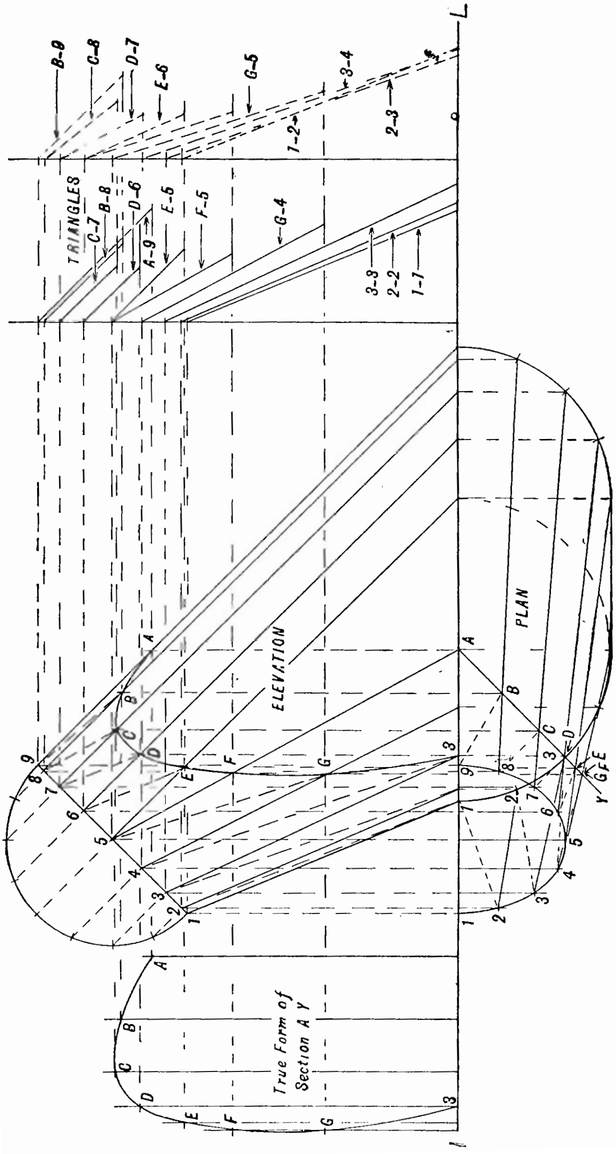


Fig. 111. *Semi-Plan, Elevation, and Diagram of Triangles Necessary to Develop the Pattern for a Four Pronged Fitting.*

were intersected by said planes to establish the form of the required fitting at the intersection of its prongs. Points as *A B C D E F* and *G* produced by the intersection of line *A Y* with those lines which are elements of the original form are the plans of those points. Vertical lines drawn from points *A B C D,* etc., of that view, then supply us with the exact distance these points are from the horizontal plane, i.e., the distance said points are above the line *I L*.

Thus we may set off along the line *I L* distances as found along the line *A Y,* and erect vertical lines as shown at the true form of section *A Y*. Horizontal lines drawn from points *A B C D,* etc., of the elevation to intersect those lines then supply points through which the line may be traced to secure a true form of section as shown.

Triangles.

The method of drawing the necessary triangles which will supply the true lengths of lines presumed to be upon the surface of the object, and shown in plan and elevation, differs in no essential respect from those methods previously explained. The length of the lines shown in plan is the base, and the difference in hight of the extremities of that line shown in elevation, is the perpendicular. As for example, to determine the true length of the line *8 B* shown in plan, we may draw horizontal lines from the extremities of line *8 B* in elevation as shown, and at any convenient point draw a perpendicular whose length is equal to the distance these lines are from each other. Set off along the lower horizontal line from the above spoken of perpendicular a distance equal to the length of line *8 B* found in the plan. This, as will be noted, supplies points between which a line may be drawn, which is in reality the third side of a right angled triangle which furnishes the true length sought, and shown at *8 B* of the diagram of triangles. Since all other required true lengths will be found in the same general manner, a detailed explanation would seem needless repetition.

It will, no doubt, demand some attention to determine which lines would be intersected by the plane *A Y*.

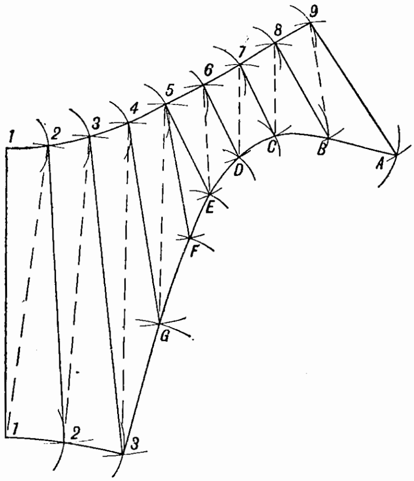


Fig. 112. *Semi-Pattern for One Prong of a Four Pronged Fitting.*

However, the construction lines shown in plan and elevation clearly show them.

The Semi-Pattern for One Prong.

Having now in mind the principles and methods which must be pursued to secure the true length of lines presumed to be upon the surface of the object, we may proceed to draw upon the plane of development those lines in their correct relative positions as shown at Fig. 112. Here, as will be noted, the line *1 1* is drawn whose length is found in the elevation, or diagram of triangles. Point *2* at the top is distant from point *1* equal to the length of one space of the circle which is the true form of the small collar at the top, as shown in Fig. 111. Point *2* at the base of the pattern is distant from point *1* equal to the distance between points *1* and *2* of the large semi-circle in plan. The true distance from point *1* at the base of the pattern to point *2* at the top is found in the diagram of triangles. Points *3* of the pattern are located in the same general manner, using measurements as found in Fig. 111.

It will be noted that the intersecting plane *A Y* has produced points *G F E D C B* and *A*, therefore we must refer to the section *A Y* to secure the true distance between said points. It may be explained that the flat triangular piece spoken of in Chapter 25, shows itself in this example at *5 F E*.

Having developed the semi-pattern as shown at Fig. 112, it may be revolved upon line *1 1* and duplicated to complete the pattern for one prong, in this instance of a four pronged fitting. As has been previously explained, the position of the intersecting plane which is presumed to cut the original form, at once determines the number of prongs in the fitting when all are equal.

Unequal Prongs.

We sometimes hear discussions on branched fittings with three or more prongs which are unequal. This at once complicates the work of developing the pattern, although we may proceed along similar lines. Having secured a form for the fitting at the junction of its prongs different formed prongs may be introduced. That is, prongs of different diameters and radiating at different angles. This involves a pattern for each prong. The only thing in common is the form at the junction of the prongs. Examples of this class are usually more in the nature of a stunt than a necessity.