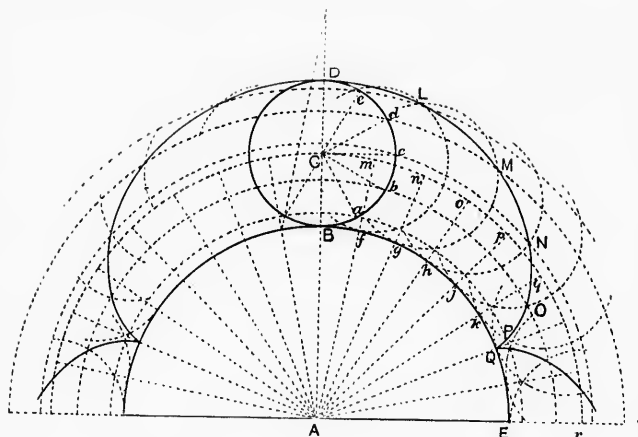




PROBLEM 78.—TO DRAW THE EPICYCLOID DESCRIBED BY A POINT IN THE CIRCUMFERENCE OF A GIVEN GENERATING CIRCLE BD , ROLLING ON A GIVEN DIRECTING CIRCLE BE .

Join the centres AC . Divide the circle BD into the equal parts Ba, ab , etc. With A as centre and AC as radius, describe an arc of a circle Cr .

With the same centre and radii Aa, Ab, Ac, Ad and Ae , describe arcs of circles.

Divide the circumference BE into equal parts Bf, fg , etc., having the same length as the arcs Ba, ab, bc , etc. (a on rolling would come into contact with f , b with g , c with h , etc.)

From A draw radii through f, g, h , etc., to meet the arc Cr in the points m, n, o , etc.

With centre m and radius CD , describe an arc of a circle cutting the arc described with the radius Ae in L . This arc Lm represents one position of the generating circle and the point L the position which the generating point D would then have reached.

Similarly with centres n, o , etc., describe arcs meeting the arcs described, with radii Ad, Ac , etc., respectively in M, N , etc.

The generating point will successively occupy the positions D, L, M, N, O, P, Q , on the curve.

The remaining half of the loop is to be similarly formed.

PROBLEM 79.—TO DRAW THE HYPOCYCLOID OR INTERNAL EPICYCLOID DESCRIBED BY THE POINT D IN THE GENERATING CIRCLE DB , ROLLING WITHIN THE DIRECTING CIRCLE EB .

The description for the external epicycloid will serve also for this curve. When the diameter of the generating circle equals the radius of the directing circle, the curve becomes a straight line.

