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Explain with neat sketch how to find the velocity of a slider in slider crank mechanism by Klein’s construction.

Question:
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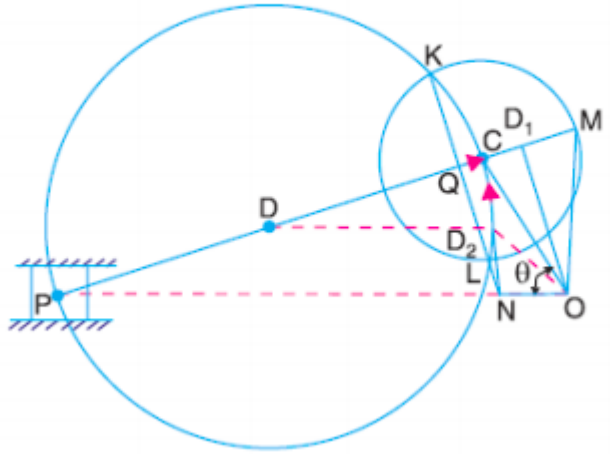
Answer:

Velocity of a slider in a slider crank mechanism by Klein's construction method



Let *OC* be the crank and *PC* the connecting rod of a reciprocating steam engine, as shown in Fig. below. Let the crank makes an angle θ with the line of stroke *PO* and rotates with uniform angular velocity ω rad/s in a clockwise direction.

First of all, draw OM perpendicular to OP; such that it intersects the line PC produced at M. The triangle OCM is known as Klien's velocity diagram.

In this triangle OCM, OM may be regarded as a line perpendicular to PO,

CM may be regarded as a line parallel to PC, (since it is the same line) and CO may be regarded as a line parallel to CO.

op_1 represents v_{PO} (*i.e.* velocity of *P* with respect to *O* or velocity of cross-head or piston *P*) and is perpendicular to *OP*, and

c_1p_1 represents v_{PC} (*i.e.* velocity of *P* with respect to *C*) and is parallel to *CP*.