第7章连杆机构设计英文教材习题

4-4 In the revolute four-bar mechanism similar to the one in Fig. 4-23b, let $l_{AB}=60$ mm, $l_{BC}=130$ mm, $l_{DC}=140$ mm, $l_{AD}=200$ mm, and $\angle BAD=135°$.

(1) Determine the type of the revolute four-bar mechanism.

(2) If the side link AB is a driver and rotates at a constant speed,

(a) find the pressure angle α and the transmission angle γ of the mechanism at that position.

(b) find the angular stroke φ_{max} of the link DC.

(c) find the crank acute angle θ between the two limiting positions.

(d) calculate the time ratio K.

(e) will any dead-point occur during the whole cycle of the motion?

(f) find the maximum pressure angle α_{max} and the minimum transmission angle γ_{min}.

(3) If the side link DC is a driver,

(a) find the pressure angle α' and the transmission angle γ' of the mechanism at that position.

(b) will any dead-point occur during the whole cycle of the motion? If so, when?

(c) find the maximum pressure angle α_{max} and the minimum transmission angle γ_{min}.

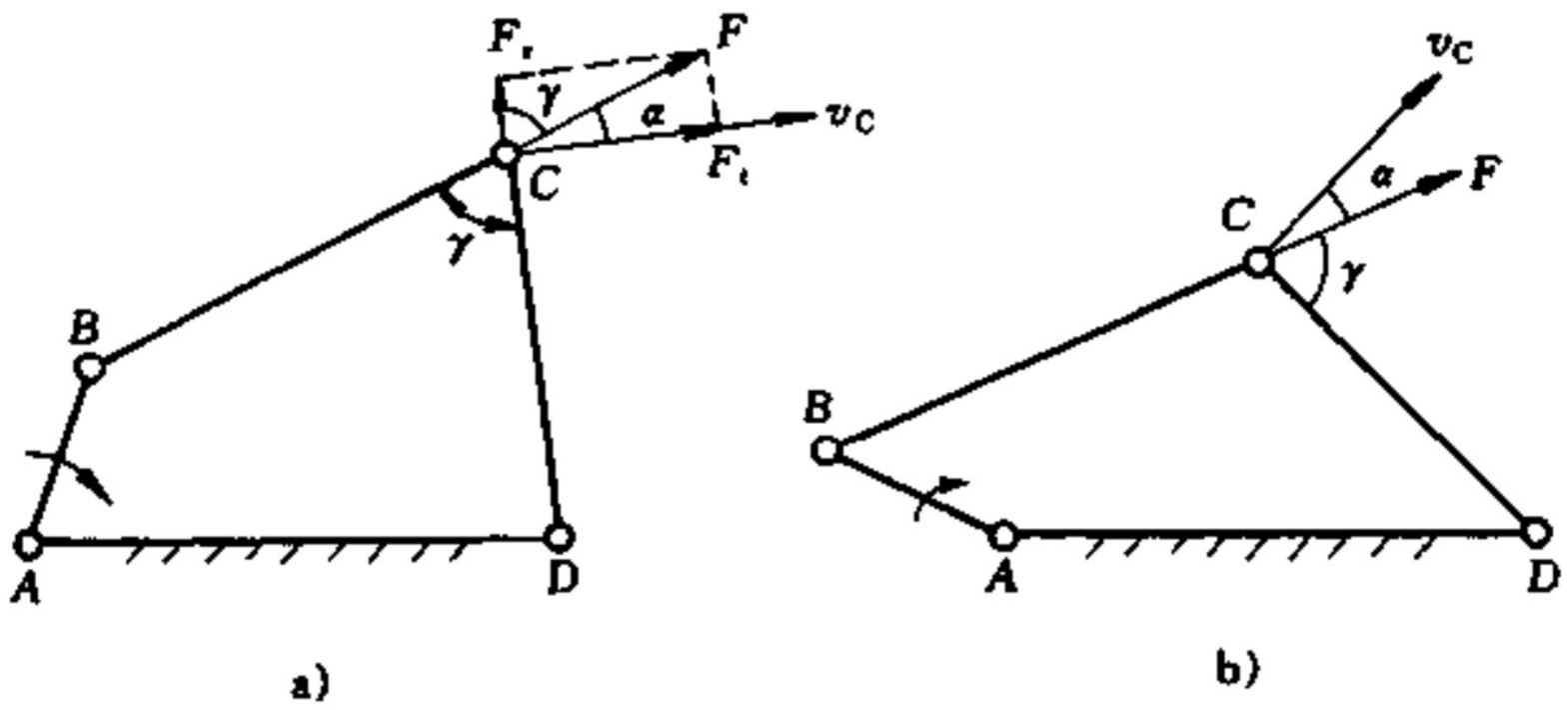

Fig. 4-23

4-5 In the offset slider-crank mechanism shown in Fig. 4-5, the driver crank AB rotates at a constant speed. Let $l_{AB}=120$ mm, $l_{BC}=250$ mm, offset $e=60$ mm, and $\varphi_{AB}=60°$. Find

(1) the length of stroke H of the slider,

(2) the crank acute angle θ between the two limiting positions,

(3) the time ratio K,

(4) the pressure angle α and the transmission angle γ at that position,

(5) the maximum pressure angle α_{max} and the minimum transmission angle γ_{min}.

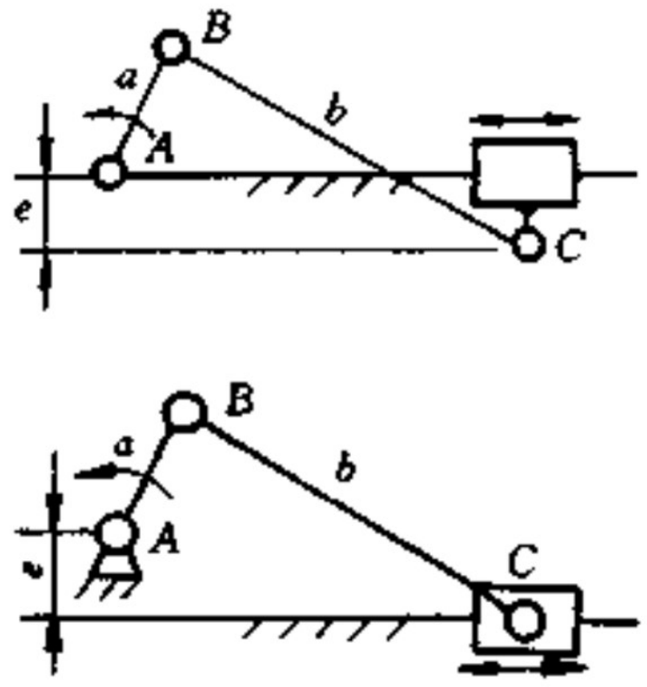

Fig. 4-5

第8章凸轮机构设计英文教材习题

5-9 For the plate cam with translating offset roller follower as shown in Fig. 5-35, arcs GH and IJ are two arcs with centre at O. Indicate radius of prime circle r_p, offset e, cam angle for rise δ_0, cam angle for outer dwell δ_s, cam angle for return δ_0', cam angle for inner dwell δ_s', and lift h. For the position shown, indicate pressure angle α, displacement s and the corresponding cam angle δ.

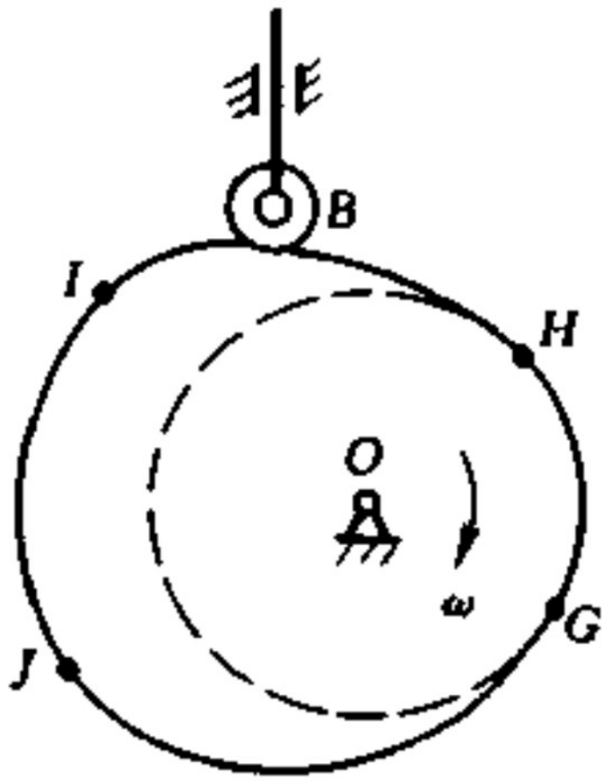

Fig. 5-35

第9章 齿轮传动设计英文教材习题

6-16 A pair of standard spur involute gears has a module of 5 mm, pressure angle $\alpha = 20^\circ$, centre distance $a = 350$ mm, transmission ratio $i_{12} = 9/5$. Calculate the numbers of teeth z_1, z_2, reference diametersd_1, d_2, addendum diameters d_{a1}, d_{a2}, base diameters d_{b1}, d_{b2}, tooth thickness s and spacewidth e.

6-22 A pair of standard external helical gears have the following parameters: $z_1 = 20$, $z_2 = 118$, $m = 5$ mm, $\alpha_n = 20^\circ$, $h_{an}^* = 1$, $B = 30$ mm, $a = 350$ mm. Find the helix angle β, total contact ratio ε_γ and the virtual numbers of teeth z_{v1}, z_{v2}.