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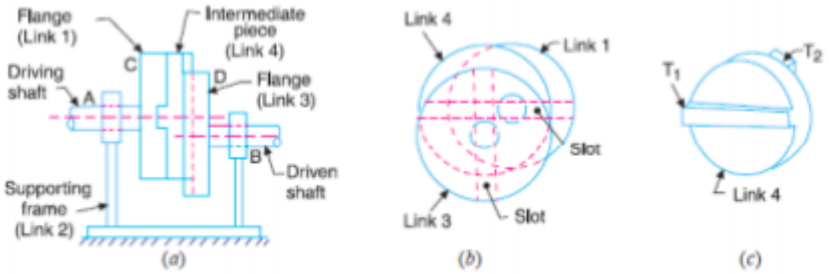
Draw a neat sketch of Oldham’s coupling and explain the working of it.

Question:
Draw a neat sketch of Oldham’s coupling and explain the working of it.

Answer:



Oldham's coupling.

Oldham's coupling. An Oldham's coupling is used for connecting two parallel shafts whose axes are at a small distance apart. The shafts are coupled in such a way that if one shaft rotates, the other shaft also rotates at the same speed. This inversion is obtained by fixing the link 2, as shown in Fig. (a). The shafts to be connected have two flanges (link 1 and link 3) rigidly fastened at their ends by forging. The link 1 and link 3 form turning pairs with link 2. These flanges have diametrical slots cut in their inner faces, as shown in Fig. (b). the intermediate piece (link 4) which is a circular disc, have two tongues (i.e. diametrical projections) T1 and T2 on each face at right angles to each other, as shown in Fig. (c). The tongues on the link 4 closely fit into the slots in the two flanges (link 1 and link 3). The link 4 can slide or reciprocate in the slots in the flanges.

When the driving shaft A is rotated, the flange C (link 1) causes the intermediate piece (link 4) to rotate at the same angle through which the flange has rotated, and it further rotates the flange D (link 3) at the same angle and thus the shaft B rotates. Hence links 1, 3 and 4 have the same angular velocity at every instant. A little consideration will show, that there is a sliding motion between the link 4 and each of the other links 1 and 3.

Fluctuations of energy: The variations of energy above and below the mean resisting torque line are called fluctuations of energy.

Coefficient of fluctuation of energy: It may be defined as the ratio of the maximum fluctuation of energy to the work done per cycle.

Mathematically,

Coefficient of fluctuation of energy,

E = Maximum fluctuation of energy/Work done per cycle

Coefficient of fluctuation of speed: The difference between the maximum and minimum speeds during a cycle is called the maximum fluctuation of speed. The ratio of the maximum fluctuation of speed to the mean speed is called the coefficient of fluctuation of speed.

Maximum fluctuation of energy:

ΔE = Maximum energy − Minimum energy

= (E + a1) − (E + a1 − a2 + a3 − a4) = a2 − a3 + a4