Double Block or Shoe Brake

•When a single block brake is applied to a rolling wheel, an additional load is thrown on theshaft bearings due to the normal force (RN).

•This produces bending of the shaft. In order to overcome this drawback, a double block or shoe brake, as shown in Fig, is used.

•It consists oftwo brake blocks applied at the opposite ends of a diameter of the wheel which eliminate or reduces the unbalanced force on the shaft.

•The brake is set by a spring which pulls the upper ends of the brake arms together. When a force Pis applied to the bell crank lever, the spring is compressed and the brake is released.

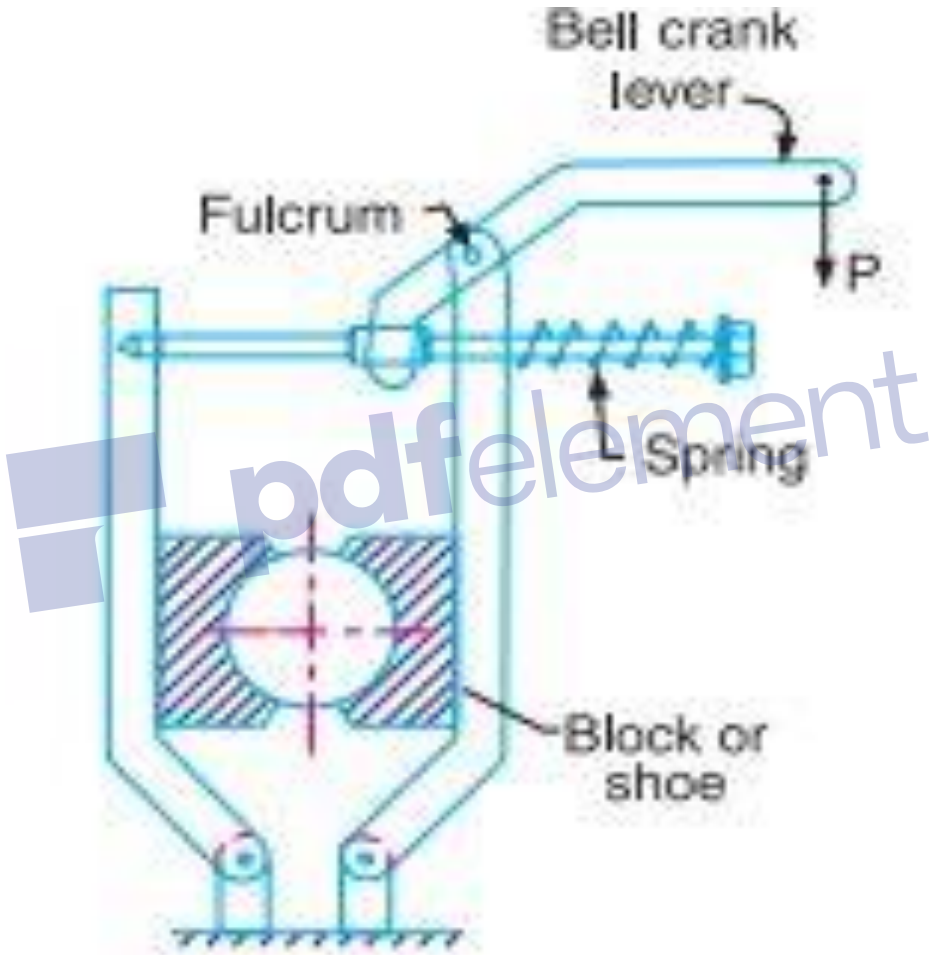
•This type of brake is often used on electric cranes and the force Pis produced by an electromagnet or solenoid. When the current is switched off, there is no force on the bell crank lever and the brake is engaged automatically due to the spring force and thus there will be no downward movement of the load.

•In a double block brake, the braking action is doubled by the use of two blocks and these blocks may be operated practically by the same force which will operate one. In case of double block or shoe brake, the braking torque is given by

TB = (F

T1 + F t2) r

where F t1 and F t2 are the braking forces on the two blocks.



Simple Band Brake

•A band brake consists of a flexible band of leather, one or more ropes,or a steel lined with friction material, which embraces a part of the circumference of the drum.

•A band brake, as shown in Fig, is called a simple band brake in which one end of the band is attached to a fixed pin or fulcrum of the lever while the other end is attached to the lever at a distance b from the fulcrum.

• When a force P is applied to the lever at C, the lever turns about the fulcrum pin O and tightens the band on the drum and hence the brakes are applied.

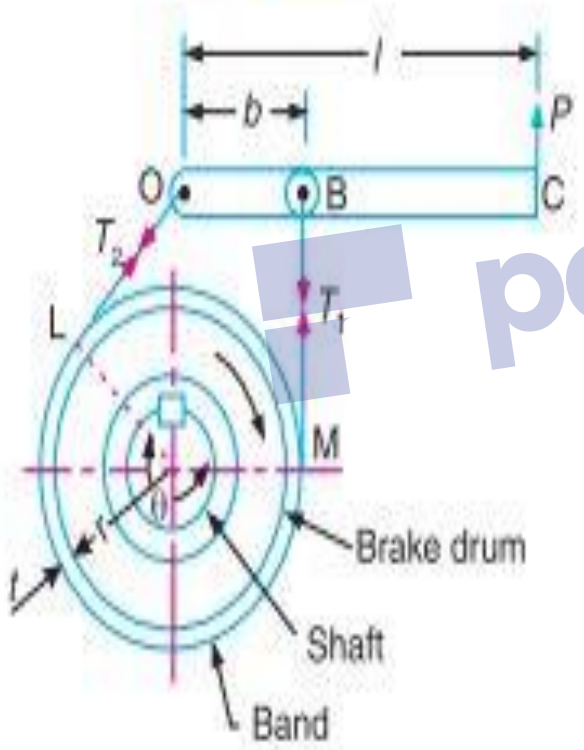
•The friction between the band and the drum provides the braking force.

•The force P on the lever at C may be determined as discussed below :

Let T1= Tension in the tight side of the band,

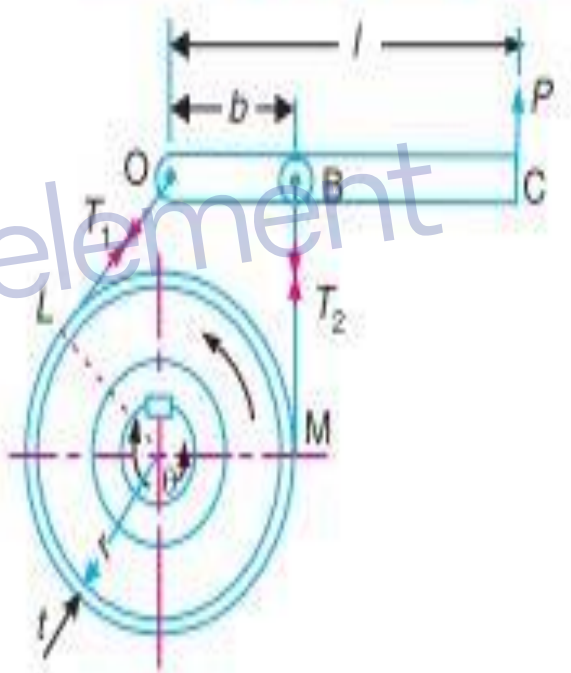
T2= Tension in the slack side of the band,

Band brake



(a) Clockwise rotation of drum.

Bands of a brake shown separately



(b) Anticlockwise rotation of drum.

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