- Centrifugal Clutch
- This clutch is controlled by the engine speed through an accelerator. When the engine speed falls down, the clutch will automatically disengage. When the speed rises above the predetermined value the clutch is engaged. Greater is the centrifugal force due to higher engine speed, more will be powerful contact between driving and driven members to obtain the engagement. Figure 3.8 shows the construction of centrifugal clutch.
- The simplest form of centrifugal clutch consists of two members, one is fitted on the driving shaft and other one is attached to driven shaft. The driven member is just a drum which encloses the driving member. The I driving member consists of a spider, shoes having friction lining at outer end and springs. The shoes are attached to the spider by means of springs as shown in Figure 3.8. The springs exert a radially inward force which is assumed constant.

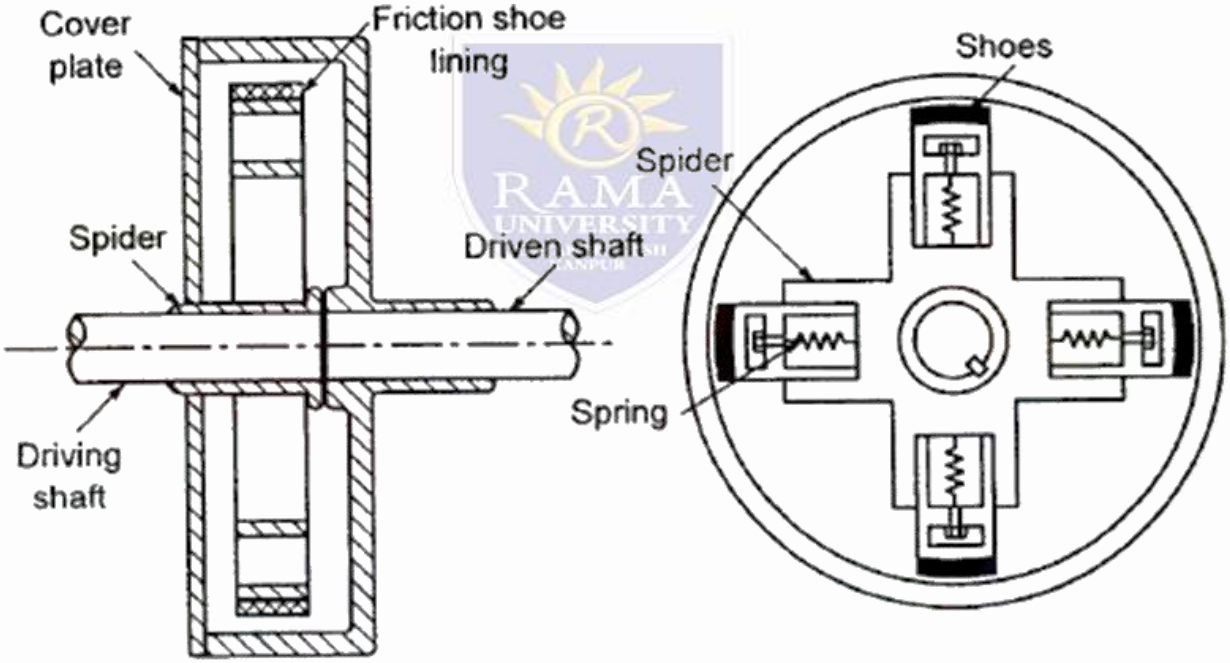

Figure 3.8 Centrifugal clutch

- The driving member rotates with the engine shaft.
- As the engine speed increases, the shoes inside the driving member drum will fly outward due to centrifugal force and come into contact with the inner surface of the driving member.
- The increase in centrifugal force due to higher engine speed binds the driving member with the driven member thereby results the rotation of both member and shafts at the same speed.
- The magnitude of the centrifugal force depends on the speed at which the shoe is revolving.
- When the engine speed decreases, the centrifugal force will decrease which results the disengagement of clutch.
- The force with which the shoe presses against the driven member is the difference between centrifugal force and spring force.
- The centrifugal clutch is extensively used in light two wheelers such as mopeds or two wheelers without gears and lawn movers.

- Semi-Centrifugal Clutch
- These clutches are similar to the centrifugal clutches with only difference of relatively light clutch pressure springs exerting low pressure at idling speed. In th..i,s; clutch, the pressure

- As the speed increases, the rotating weights will tend to move the pressure plate towards the flywheel.
- The ends of release levers are also moved back against the throw-out bearing along with this movement of the pressure plate. This construction permits the use of relatively light clutch pressure springs which exert low pressure at idling speed and facilitate epressing the clutch pedal for gear shifting.

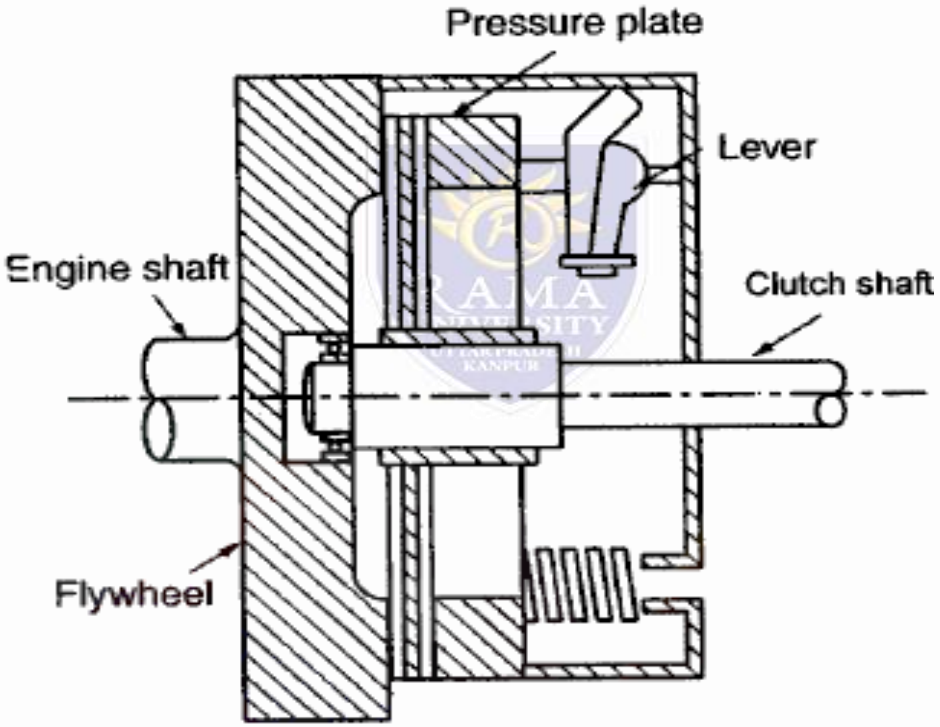

Figure 3.9 Semi-centrifugal clutch

- . Diaphragm Clutch
- The construction of this type of clutch is similar to a single plate clutch except that ttldiaphragm springs called Belleville springs are used instead of the ordinary coil spring.
- This type of clutch is more advantages because it requires no release levers and the spring itself acts as a series of levers. The pressure of the spring is always varying.
- It increases till the spring reaches to its flat position and decreases with the passing of this position.
- If this clutch is used, the driver does not require to exert such heavy pedal pressure to hold the clutch out of engagerrrenras-in-the ease-of coil-spring.type clutch.

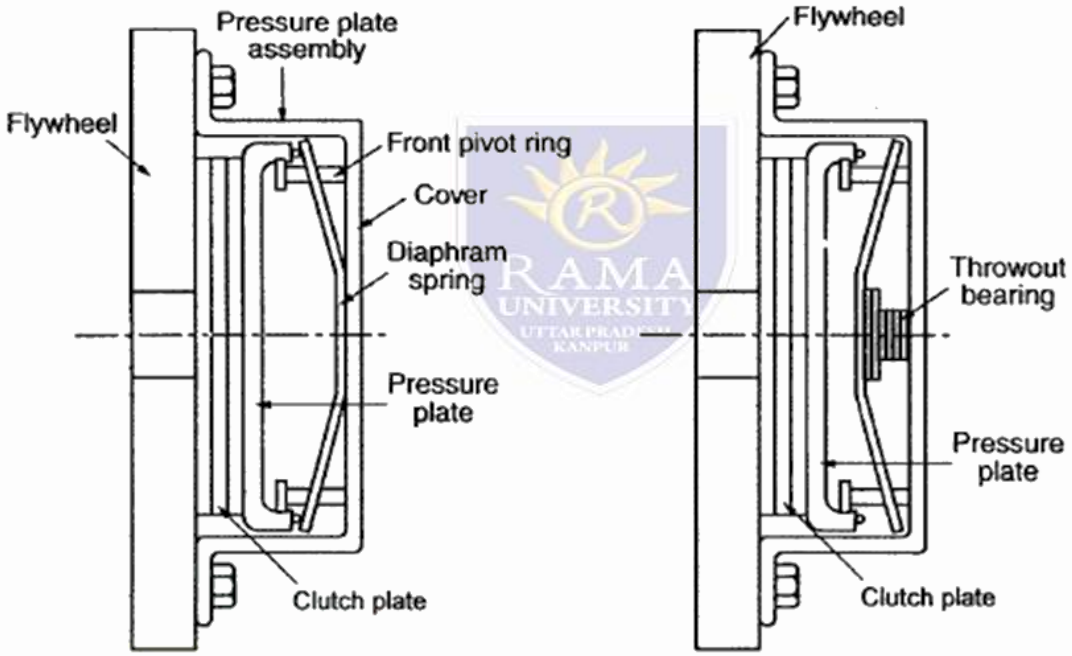

Figure 3.10 Diaphragm clutch

- Figure 3.10 shows the construction detaus of the diaphragm clutch. It consists of a diaphragm spring which is supported on a fulcrum retaining ring i.e. pivot ring so that any section through the spring can be regarded as a simple lever.
- In the engaged position, the spring pivots on the rear pivot rings as it is held in a clutch cover so that its outer rim contacts the pressure plate.
- In this position, the pressure plate is in contact with its outer rim. Therefore, sufficient pressure is exerted by the spring making a firm contact between pressure plate and clutch plate as well as the flywheel in its natural conical position.
- To disengage the clutch, the pedal is depressed to cause the linkage to move throw-out bearing towards the flywheel.
- As the bearing contacts the inner position of the conical spring, it moves forward which causes the rim to move backward since the spring pivots on the front pivot ring.
- It removes the pressure on the pressure plate and releases the clutch disc from contact with both driving members.

- Advantages:
- 1. It requires lower operating effort due to reduced friction in the clutch mechanism. 2. There is a constant and uniform load on the driven plate throughout the life of a clutch.
- 3. - At high speeds, the clamping load on the diaphragm springs is not affected as in the case of coil spring which starts bowing or distorting transversely.
- 4. The dangerous vibrations in the vehicles are altogether eliminated because it provides accurate balance at all times.
- 5. Due to its compact design, a clutch housing required is quite short.
- 6. Due to firm foundation and absence of vibrations, it eliminates squeaks and rafting.