

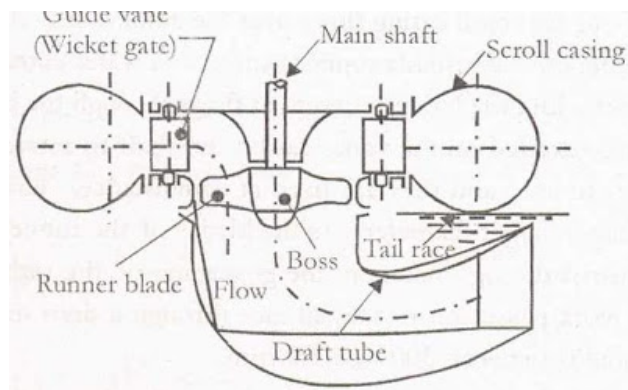
KAPLAN TURBINE

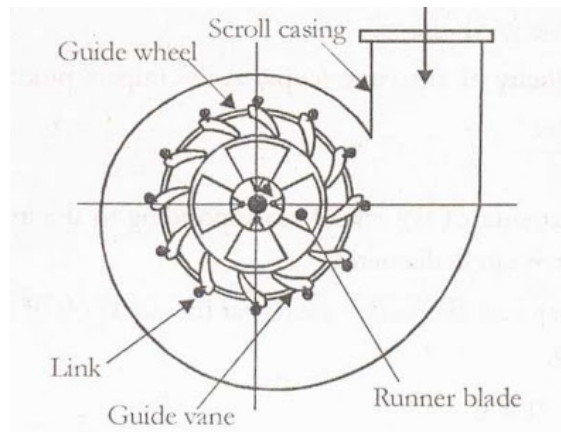
It is an axial flow reaction turbine. This operates in an entirely closed conduit to tailrace. Kaplan turbine is employed, where a large quantity of water is available. It consists of spiral casing, guide mechanism and draft tube of Kaplan turbine runner are similar to those of Francis turbine.

WORKING PRINCIPLE OF KAPLAN TURBINE

Kaplan turbine consist of the following parts

- a) Spiral or scroll air tight casing
- b) Guide mechanism
- c) Runner and main shaft
- d) Draft tube
- e) Governor





In the Kaplan turbine the runner has 4 to 6 blades attached to the hub or boss. The water enters the turbine in the axial direction. Since only a few blades are used the contact surface with water and hence the frictional resistance is reduced. The blades are made of stainless steel. The runner blades are so arranged that their angle of inclination can be adjusted while running. Hence the Kaplan turbine is also called variable pitch propeller turbine.

The whole mechanism is enclosed in a central boss, which is operated by the governor through the action of servomotor. By this means, the blade angles are automatically adjusted while running according to the power developed by the turbine. In the Kaplan turbine both guide vane angle and runner blade angle may be varied. This results in higher efficiency.

Working

The water from the scroll casing flows over the guide vanes. It is then deflected through 90° and enters the adjustable runner vanes. The water enters with maximum potential energy and with little kinetic energy. It flows through the blades in the axial direction. The force exerted on the vanes causes the shaft to rotate. In this turbine only 3 to 6 blades are used and they are fixed at equidistance. The runner is in the form of boss having a bigger diameter. As the blades of the runner as well as guide blades can be adjusted during operation, the governing of the turbine is easy. The water after doing work passes on to the tail race through a draft tube. The specific speed of this turbine is between 300 to 1000 rpm.

Source : <http://mediatoget.blogspot.in/2011/11/kaplan-turbine.html>