Appurtenances in the distribution system :

Appurtenances are fitted in the pipe network and distribution system f or its efficient and controlled functioning.

The following are some appurtenances of distribution system:

1. Fire hydrants
2. Water meters
3. Water taps
4. Stop cocks
5. Pipe bends

FIRE HYDRANTS:

A Hydrant is an outlet provided in water distribution main or a sub-main for tapping water mainly during fires and sometimes used for withdrawing water for Filling the municipal water tankers.

During fire breakout, a nearby hydrant is connected to the fire hose, and water obtained from the hydrant is used to extinguish the fire.

Fire hydrants are used so as to obtain the water at high rates and also to make it reach several storeyed high buildings, such pressures are generally developed by attaching fire hydrants outlet to the fire engine.

REQUIRMENTS OF GOOD HYDRANTS:

i. It should be such as to connect the hose or the motor pump easily to it.

ii. It should be cheap.

iii. It should be easily detectable during the panicky atmosphere of fire.

iv. It should not get out of order during the operation.

v. On being fully opened it should allow undisturbed water f low.

TYPES OF FIRE HYDRANTS

1) Post Fire Hydrants

2) Flush Fire Hydrants

1) Post Fire Hydrants:

The post fire hydrant remains standing above the ground like a post by about 0.9 to 1.2m.It can be detected very easily as they project above the ground. They are liable to be damaged by children and mischief mongers. They are widely used in countries like America, because of the greater civic sense prevailing there.

Parts of Post Fire Hydrants

☐ Cast iron barrel of hydrants

☐ Valve stem- Leather valve at lower end, top end connected to the nut

 Valve seat

 Drain valve

 Outlet pipe-with nozzle cap a t he periphery of the hydrant barrel
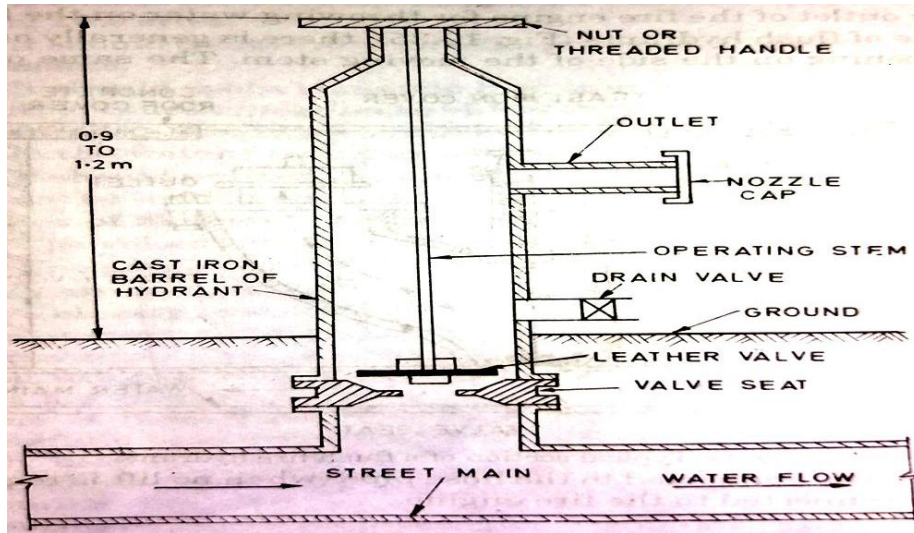
Working

In closed position the leather valve rest at valve seat, for opening the hydrat the nut is operate so as to raise the leather valve up, thereby admitting the water in to the hydrant barrel. The outlet at the periphery of the hydrant carries the water to the location through hose pipe.

 Outlet diameter:

 63 mm diameter outlets: when boosting of pressure is not required

 100 mm diameter outlets: when boosting of pressure is required for connecting it to fire engine or pumps.

2) Flush Fire Hydrants

It is installed underground in a brick or cast iron chamber with its top cover slightly above the street level. Under the panicky circumstances during fire, it is difficult to search the flush fire hydrants. They are less prone to damage by mischievous people.

Parts of Flush Fire Hydrants

  Masonry wall

 Cast iron cover

 Concrete roof cover

  Valve stem

  Leathervalve

 Outlet

Working

There is only one outlet opening on the side of the moving stem. The same opening may be directly connected to the hose pipe or may be connected to the fire engine.
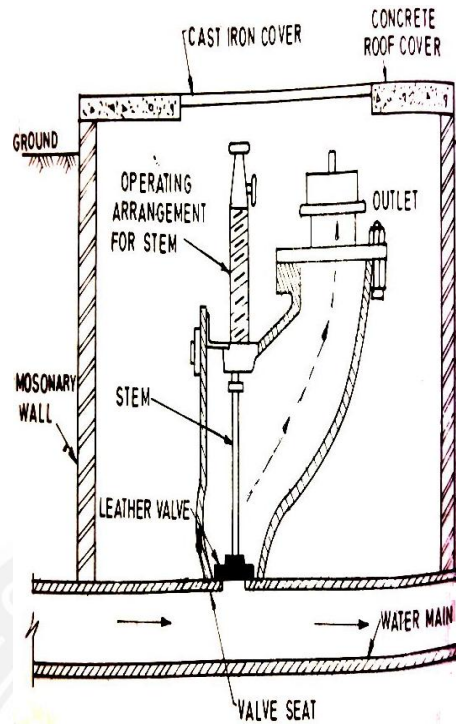
WATER METES:

Water meters are the devices which are used for measuring the quantity of water flowing under pressure through a pressure conduit. The measurement of quantity of water supplied to the general public is necessary, in order to charge the consumers according to the quantity of water supplied to them.

Requirements of good Water Meters

☐ It must record the entire water passing through it.

☐ Its maintenance and repair should be easy.

☐ It should measure the discharge within the maximum limit of 20% error.

☐ It should be able to work efficiently at all pressures in the mains.

☐ It should cause minimum hindrance to the flow and therefore cause minimum head Loss in working.

☐ Its parts should not be easily affected by the chemicals present in the water passing through it.

☐ It should prevent the back flow passing through it and should not be liable to clogging.

Types of Meters

☐ Velocity meters or the inferential meters.

☐ Positive meters or the Displacement meters.

1) VELOCITY METERS OR THE I NFERENTIAL METERS

☐ It measures the horizontal velocity of water flowing through them.

☐ It can be successfully used f or measuring high flows.

☐ Generally used f or measuring supplies to industries and trades

☐ They are available in smaller sizes up to 20 mm; therefore it is also used for measuring small domestic supplies.

☐ Their accuracy is less when compared to displacement meters

Examples of velocity meters:

☐ Rotary meters

☐ Turbine meters

☐ Venturimeter

Rotary meters:

☐ It consists of radial vanes attached to the shaft and enclosed in the casing.

☐ When water entering with certain velocity passes through the meter , the radial vanes are rotated in clockwise direction.

☐ The number of revolutions per unit time depends upon the velocity of flow.

☐ The greater the velocity the higher will be the speed of rotation.

☐ The discharge is proportional to the speed of the shaft.
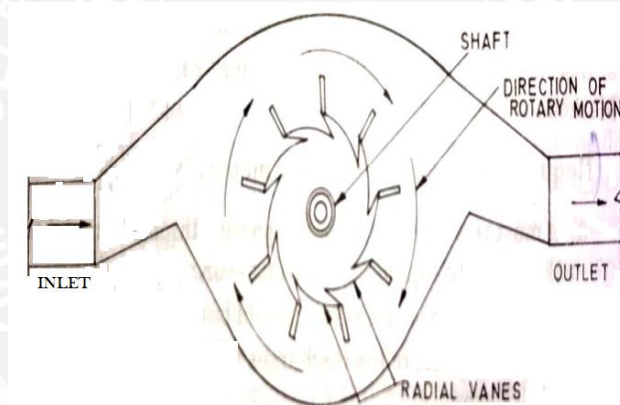
The meter can hence be calibrated to directly read the discharge.

Turbine meters:

☐ It is similar to rotary meter.

☐ It consists of turbine wheel which is rotated by moving water.

☐ The number of revolutions made by turbine wheel will give the discharge as in rotary meters.

Venturi-meter:

☐ It works based on the principle of Bernoulli's equation.

☐ It is preferably used to measure high flows in large pipes with nominal head loss.

☐ It is not suitable to measure small flows.

☐ The venturi-meter consists of gradually contracting the normal pipe to the throat section and then expanding to normal size.

☐ Piezometers are inserted at normal end and throat section.

☐ The discharge through pipe is proportional to the difference of head between two piezometers

☐ It measures the head difference (H-h) and then integrates the discharge over any period of time.

Stop cocks

☐ Screw down type valve used for stopping and opening water supply

☐Generally provided before the water enters the water meter

☐Also provided inside the building