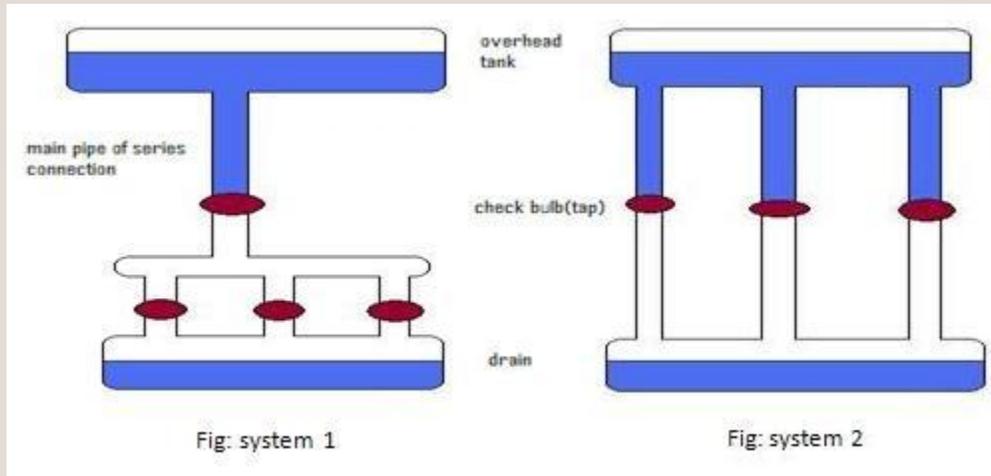


Understand electrical circuit - comparison with water system

To understand the **electrical circuit** physically the circuit can be thought as a closed water system. It is just for the novice learners so that they can understand the electrical network physically without complex imagination. It is not like that **electrical system** is not analogous to other mechanical system. But for the learners who are first learning this they may find it difficult to compare it with mechanical system. Besides this, a water system is easy to understand physically. If a student wants to think further about the electrical characteristics he can easily do it.

Now what is this comparison? Let's take the example of water connection of your washroom. Here the water initially stored in the overhead tank. Then through the pipe connection it reaches to the every taps in the washroom. When the taps are not opened still they contain the water inside the pipe. And they are ready to flow the water when the tap will open.



Further we consider the connection of the pipe can be made in two systems.

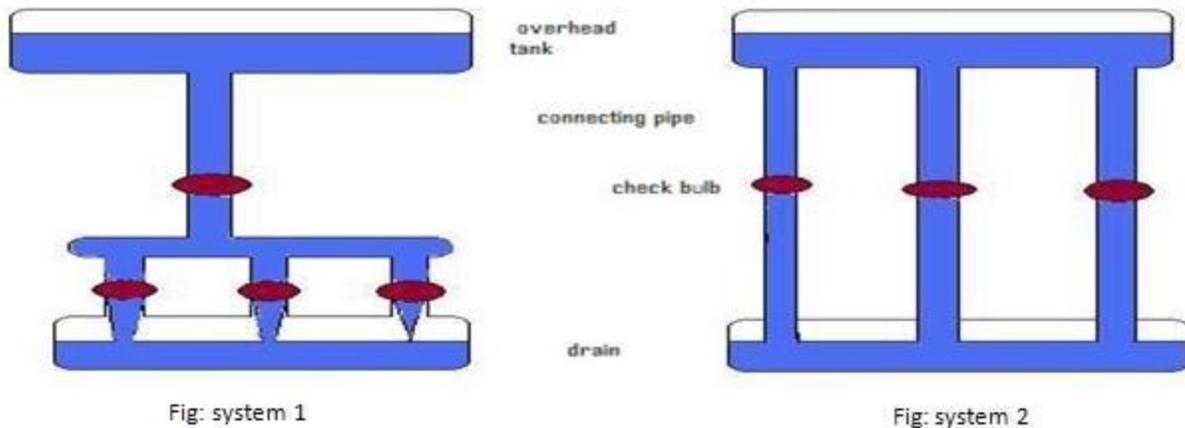
In the first system small pipes are connected with one big pipe and this big one is directly connected to the overhead tank.

In the second way consider all the pipes are directly connected to the tank.

Now you wish to go to the washroom and open a tap then the water from the tap will fall down. This water will reach to the drain.

If you open all the taps of the second system then there will be no disturbance in water flow in different taps. All they will give the water with full volume.

If you open one pipe in the first system then you will get the water in full volume. But when you will open all the taps simultaneously then you will not get the water from the tap with full volume. The nearest tap will give the more water than the far one.



Again consider in the second case one pipe has been broken down. Water from that pipe will fall down. But the others pipe are ok and there will no disturbance in their water flow.

On the other hand if one pipe breakdown in the first system it will disturb the other. And most of the case no water will flow in the other taps.

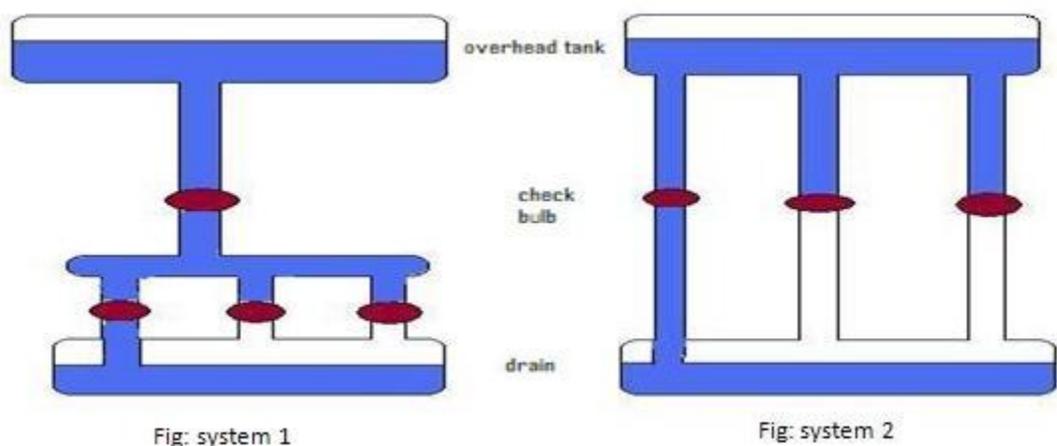
Now we consider a DC circuit. Here we have a DC source, which have a positive terminal and a negative terminal.

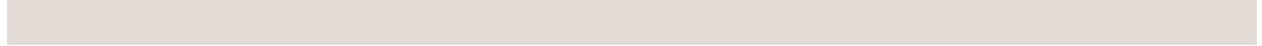
This positive terminal is analogous to the overhead tank and the negative terminal is similar to the drain. The pipes here can be compared with the conducting path. In the case of a parallel circuit if one branch does not conduct it will not disturb the other branches. The second washroom is analogous to this parallel circuit.

In the first case the physical system represents the series circuit. Here if water flow in the main pipe is blocked then water flow in the others will off.

The overhead tank and the drain play the role of potential source. As the water goes down to the drain, the potential decreases.

Here the short circuit phenomena and the open circuit phenomena can also be explained. The level of overhead tank and the drain will be same if excessive flow (infinite) in a branch makes the two levels equal. Then there will no flow in the other pipes because two levels are equal. And the open circuit phenomenon is simply the blockage of water in a pipe.





Source: <http://engineering.electrical-equipment.org/electrical-distribution/understand-electrical-circuit-comparison-with-water-system.html>