

ARCHIMEDES' SCREW

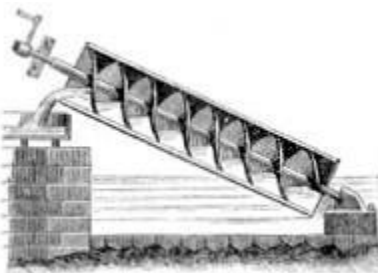
Archimedes' screw, or the Archimedean screw, is a simple machine, historically used for transferring water from a low-lying body of water, mostly into irrigation ditches.

What screw is

A screw, in this case, is simply an inclined plane (another simple machine) wrapped around a cylinder.

Invention

It is one of several inventions and discoveries reputed to have been made by Archimedes, through writings about the Hanging Gardens of Babylon. as early as 600 BC.



Archimedes' screw

Old design

This machine consists of a screw inside a hollow pipe.

How it works

The lower end of the device is put in the water, and the screw is then turned (usually by a windmill or by animal or human labor). As the bottom end of the tube turns, it scoops up an amount of water. This puddle of water will slide up in the spiral tube as the shaft is turned, until finally it falls out from the top of the spiral tube and feeds the irrigation system.

Requirement

The interface between the screw and the pipe does not need to be perfectly water-tight because of the relatively large amount of water being scooped at each turn in respect to the angular speed of the screw. Also, water leaking from the top section of the screw leaks into the previous one and so on, so a sort of equilibrium is achieved while using the machine, thus reducing the decrease in efficiency.

Early Uses

Along with transferring water to irrigation ditches, this device was also used for "stealing" land (in early days) from under sea level in Netherlands.

Since the primary objective in this case is to lift water to a given height rather than simply move it from a river to the irrigation ditches, more than one machine was used to successively lift the same volume of water , due to the limitations of this machine.

The mechanism is also used in coal fired power stations to move slurries and in some injection moulding industries to move the paste to the moulding dies.

Source : http://engineering.wikia.com/wiki/Archimedes%27_screw