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MINI POWER GENERATION USINGSCREW TURBINE

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Abstract
The main limitation in hydro power generation is continues and constant flowof the Water with high pressure. to overcome this main disadvantage screw turbine is good option The screw turbine is invented before 300 BC by Archimedes that ’s why it is also called as Archimedes screw turbine.By this project we can overcome the other hydro power generation technic draw back the main advantage of the screw turbine is it can work with low pressure water or with water full of dirt the solid contents like stone, branches etc. cannot affect the operation of screw turbine.

1. Introduction

The source of energy of Hydropower is renewable source of energy. Water energy was of great importance for sustainable because it is a clean environment friendly source of power generation. Among the energy from renewable energy sources water in mini/micro hydro power has gained the highest attraction due to its environmentally friendly operation. In current scenario, India is blessed with half of million location where water mills were served for centuries.
The screw turbine is mostly used for low water pressure. In agricultural use where water is feeded By cannel system that’s why the water pressure not efficient to run kapline turbine or Peltonturbine. Their screw turbine most efficient to place or power generation.

2. Future Scope of project - As noticed outcome from this project we noticed that the manufacturing of the project is simple as we know the other hydro power plant have high manufacturing coast and maintenance coast but is case of these power generation both of them can be minimized.
The major plus point of the screw turbine is it renewable type of energy and cannot harm to the water life cycle the special filtration is not needed.

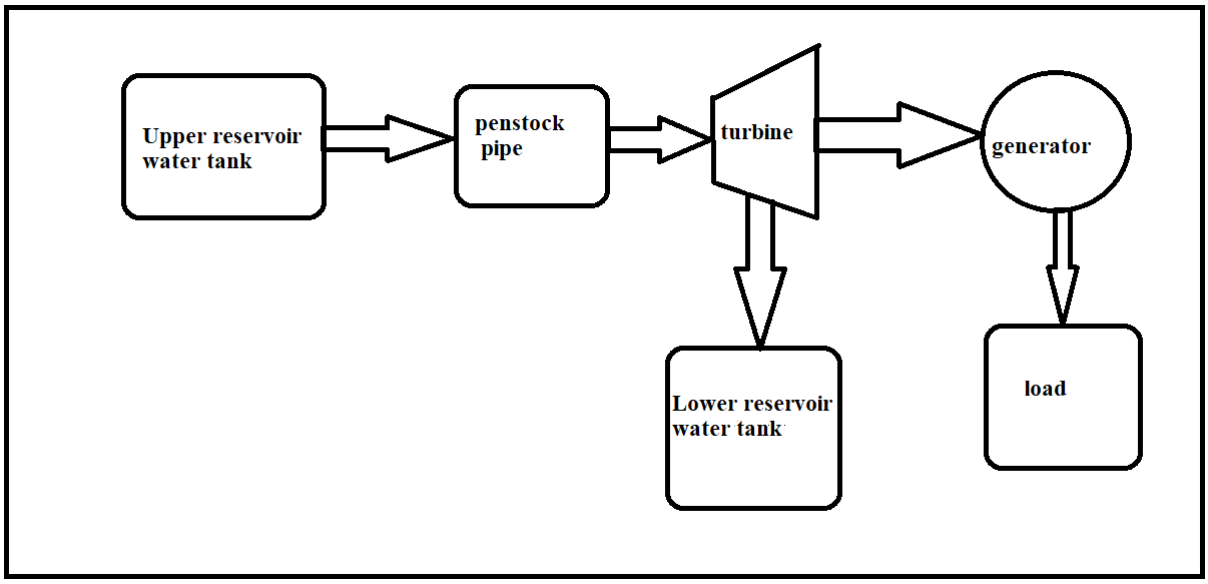
3. Objectives of the project -

Power optimization comparatively high than other turbine.To show the advantages of the screw turbine over other.

The screw turbine is low pressure turbine used in low water level also.Many agricultural applications.

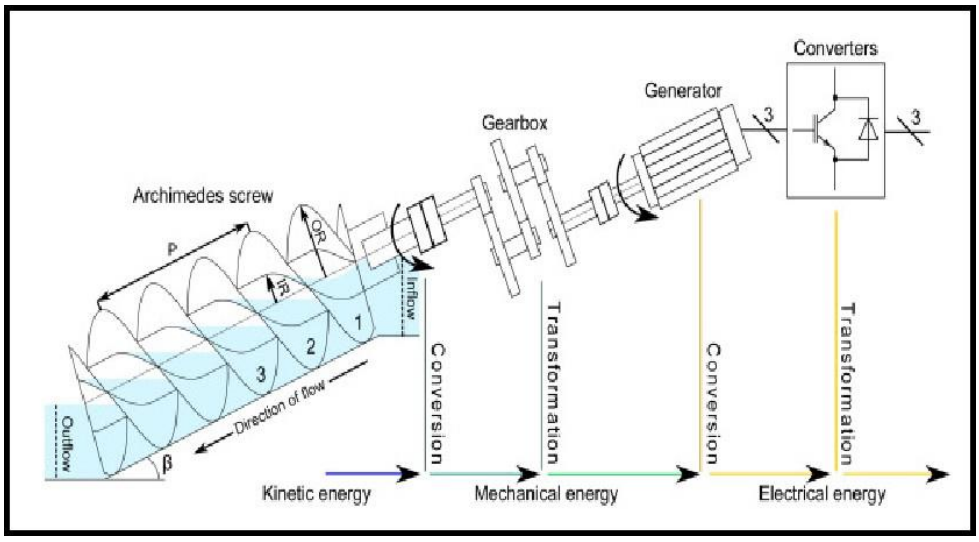
The location choice is flexible requirement of water is also less so that we can build it on small rivers it plays an important role in preventing the fishes and other living water creatures frominjuries or avoid deaths of fishes from the side effect of dams.

4. Block diagram of project



Block Diagram of Actual Screw Turbine

5. construction



Constructional diagram of the screw turbine

As we can see the turbine is connected to the generator assemble with gearbox which increase or decrease the speed of the generator with respect to the gear ratio the generator is connected to the converter circuit which optimizes the voltage stability.

The screw turbine is also known for the low-pressure turbine. It consists of screw shaped bucket arrangement which rotates when water pressure was applied on them. This are inclined at particular angle to maintain the water pressure needed for rotation.

The kinetic energy stored in water at upper water tank is send to the pen stock which increase the pressure of the water and send it to the turbine housing were the turbine get rotate because of the pressure applied by the water on each blade then this kinetic energyis converted into mechanical motion that is mechanical energy.

6. Power conversion in screw turbine

Kinetic to Mechanical

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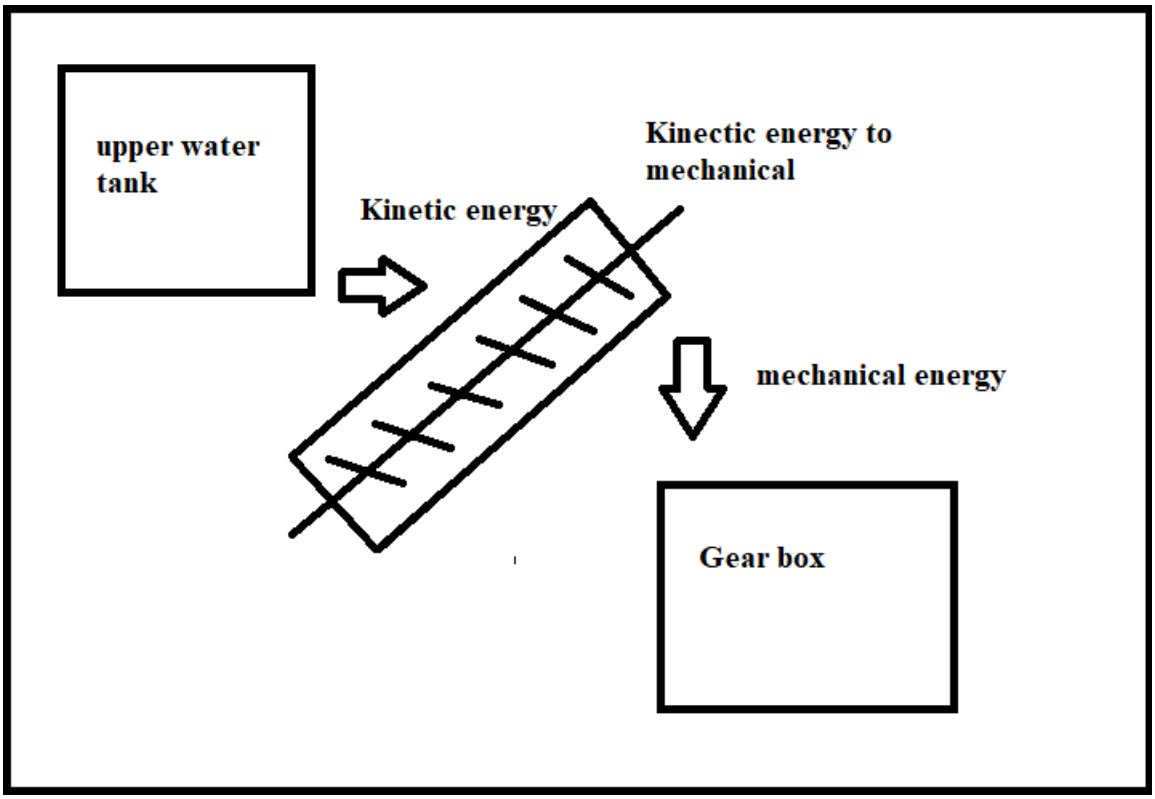
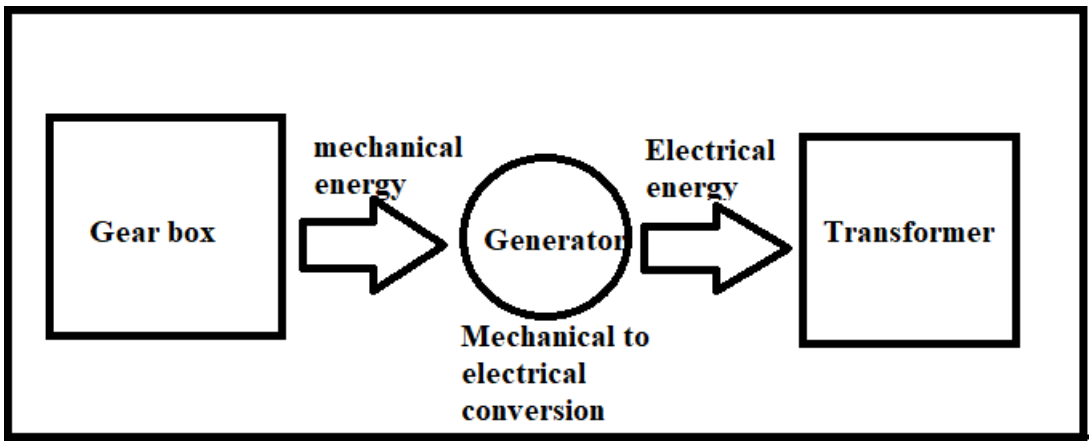


Kinetic to mechanical conversion in screw turbine

Mechanical to Electrical

Then the mechanical energy get from the turbine is then passed to the gear box were this energy rotation is reduced or increased by the gear ratio then it is further connected to the generator unitwhich is electromagnetic device which converts the mechanical energy to the electrical energy. This electrical energy is Furter given to the transformer unit which step up or stepdown

voltage.



Mechanical to electrical conversion

7. Working of screw turbine

Archimedes' screw can be used to generate power if they are driven by flowing fluid instead of lifting fluid. Water transiting the screw from high to low elevation generates a torque on the helical plane surfaces, causing the screw to rotate The Archimedes screw generator consists ofa rotor in the shape of an Archimedean screw which rotates in a semi-circular trough. Water flows into the screw and its weight presses down onto the blades of the turbine, which in turn forces the turbine to turn. Water flows freely off the end of the screw into the river. The upper end of the screw is connected to a generator through a gearbox. The Archimedes screw is theoretically a reversible hydraulic machine, and there are examples of single installations where screws can be used alternately as pumps and generators.

8. Actual Overview of The Screw turbine (Project Model):

side view

top view

front view

9. Output Got for Different Inclination

Sr. No.	Inclination	Q(l/s)	Head(M)	Speed (N)	Torque (Nm)	Power (WATT)	Nm
1.	20	2.6	0.22	110	0.14	1.5	0.42
2.	30	2.6	0.38	180	0.10	1.5	0.48
3.	40	2.6	0.51	200	0.07	1.7	0.50
4.	50	2.6	0.69	240	0.05	1.8	0.52
5.	60	2.6	0.80	280	0.03	2	0.47

10. Problem Statement

The Screw turbine becomes inefficient if the water containing sludge stones and wood sticks which may damage the turbines which is costly for maintenance. It is essential to provide filter assemble for it which is costly again. The inclination of angle used for turbine should be perfect otherwise it causes loss of energy and continues constant water flow.

11. Proposed Methodology

Proposed methodology Make water turn while water moving down as the length, while Hydrostatic pressure from water flows in to the top of the screw. It has been fast using glue and covered by cylindrical casing. The diameter of shaft, screw and housing were selected according to available tools and material. Blade of screw turbine and casing made up of aluminium for easy Mach inability, and shaft is made up of PVC pipe.

12. Conclusion

In this project we learn and conclude that the outcome of the project we get is most advantagesFor the low pressure power generation. This type of power generation is very useful for agricultural use the cannel water is feeding to the farms. The farmer can generate essential power through the continuous water flow through the cannel. It is also useful for the short power generation like hilly area. The water needed for the power generation can be contain dirt and stones. This turbine can with stand with dirty water and it cannot affect aqua creature.

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