



GENERATION OF ELECTRICITY BY PRESSURIZED WATER WITH HELP OF PEDAL POWER

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Abstract

As its name implies “Generation of electricity by pressurized water using pedal power” basically it’s an idea to generate the electricity with the help of air and water without using any costly resources like pedal power and to reduce any extra cost regarding to electricity. Its whole safe because prime factor that we are using water and air with pressure pedal. When water with compressor air strike over the vanes of turbine it cause and allowed to turbine to rotate at a greater speed and turbine is directly connected to generator with the help of spur gear which convert the mechanical motion into electrical energy. It is a great device to generate the electricity for domestic purpose without using any extra cost and avoid various expensive way which are not supportable and harmful for nature and human beings.

Keyword: Air, Water, Air tank, Pedal machine, Spur Gear, Pelton Wheel Turbine, Led light panel

Introduction

Compression system-Generally in compression system we are taking two factors water and air in pressure form with using the compressor tank with the help of pressure pedal machine. When we fill the suitable ratio of air and water in the tank with help of pedal then water is allowed to come out from tank at a high pressure.

Electricity generation-This pressure has a tendency to rotate any turbine. This motion of turbine is used to generate the electricity. When dynamo rotate it causes the electricity generation without any fluctuation in speed.

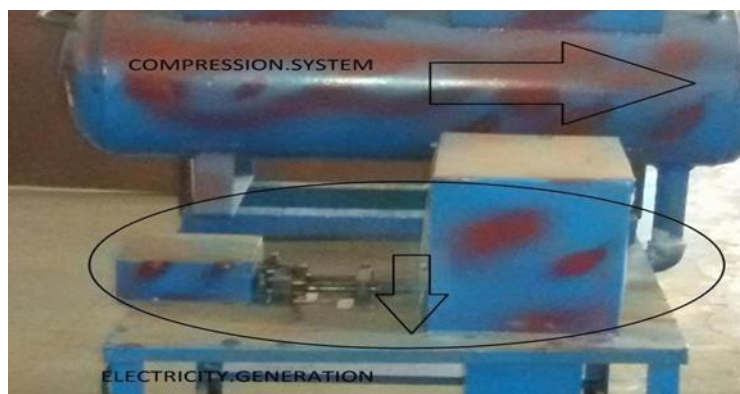


Fig-1 Electricity generation system

Literature

Construction of this instrument we follow following steps.

Step-1

Firstly we constructed and assembled the water tank, pedal pressure machine and its mountings.



Fig-2 Air & Water tank



Fig-3 Pedal pressure machine

Step-2

Leakage testing of water tank with the help of air and pressure gauge instrument.

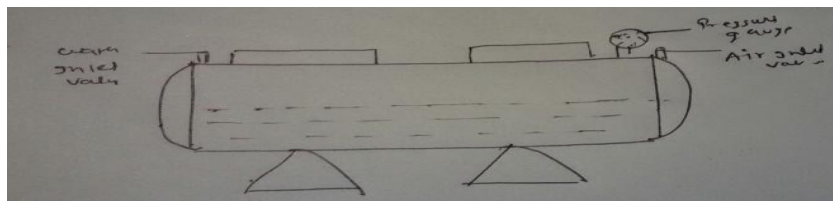


Fig-4 Air & Water tank with pressure

Step-3

We fix various mountings over tank and then it to supporting device with pedal.



Fig-5 Mounting over tank

Step-4

Now we construct and assemble the piping system and nozzle from tank.



Fig-6 Piping arrangement with nozzle

Step-5

Construction of pelton wheel turbine an its upper and lower casing.



Fig-7 Pelton Wheel Turbine

Step-6

Attachment of pelton wheel turbine to supporting device at its proper place with the help of bearing.

Step-7

We connect the whole piping arrangement from water tank to turbine

Step-8

R.P.M testing of Pelton wheel turbine with the help of tachometer.

Step-9

Construction and assembling of dynamo for electricity generation.

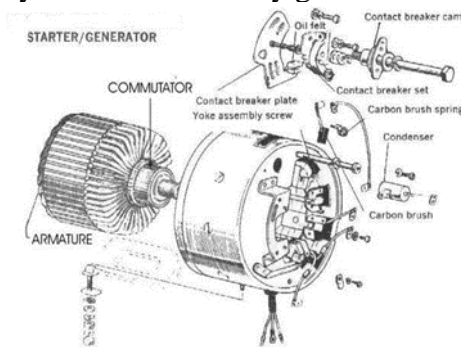


Fig-8 Dynamo

Step-10

Assembling and meshing of spur gear mechanism (i.e. pelton wheel shaft and dynamo shaft)



Fig-9 Gear(Spur) arrangement

Step-11

Wiring arrangement from dynamo to various load devices.

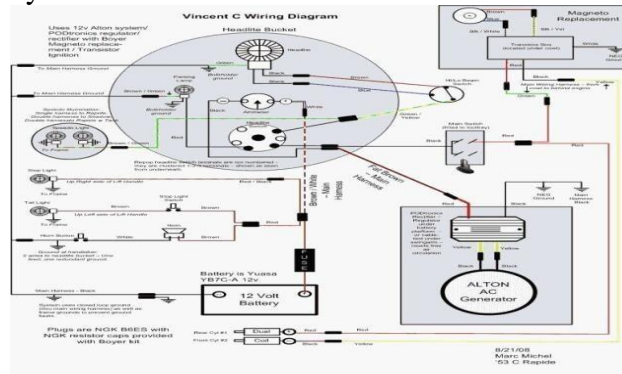


Fig-10 Wiring arrangement from dynamo

Step-12

Testing of dynamo output with the help of Multi Meter.



Fig-11 Dynamo reading

Components used

- Pressure gauge
- Pressure relief valve
- Air incoming valve
- Water tank
- Air compressor
- Spur gear mechanism
- Bearing
- Pelton wheel turbine
- Pipeing arrangement
- Nozzle
- Dynamo
- Holding table
- Electrical LED panel

Principal & working

Working of instrument consider in two sections.

- (i) Compression system (mixture of water and air)
- (ii) Electricity control mechanism and generation system

(i) Pressurized system

Turn on mode: At the time of turn on mode initially open the water incoming valve and close the air incoming valve. And after that the water valve is close and air valve is open and vice-versa.

Turn off mode: After filling the together water and air, both valves is close firmly to avoid any kind of leakage. (ii)Electricity control mechanism and generation

This mode is lively only when switch providing in mid of nozzle and piping is on/off.

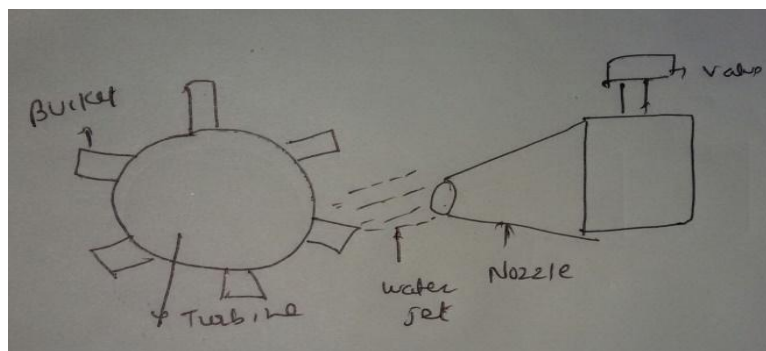


Fig-12 When nozzle is in working mode

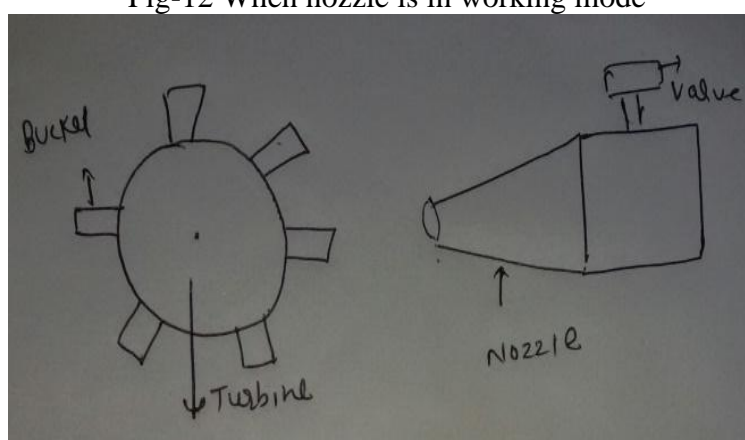


Fig-13 When nozzle is in non-working mode

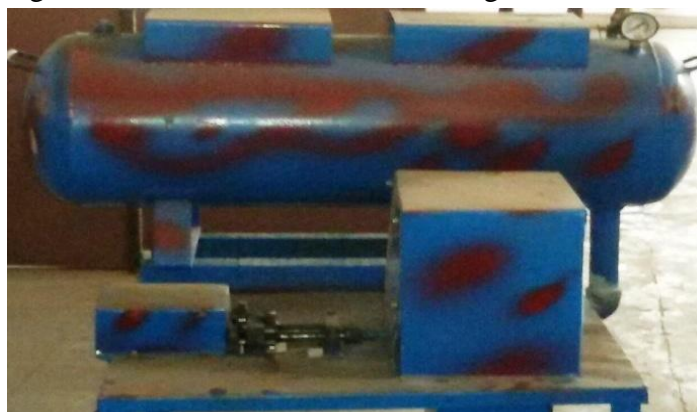


Fig-14 Complete arrangement of system

Calculation observation

Diameter of tank = 100.35cm Length of tank = 90.19cm

Volume of water tank = 712655.97cm³ Volume of tank in liter = 71.2657

Inlet diameter of nozzle = 25.6mm Outlet diameter of nozzle = 7mm

Total number of buckets of turbine = 15 Teeth of gear T1 = 11

T2 = 35

T3 = 22

T4 = 29

Velocity ratio (N1/N2) = T2/T1 At N1 = 1052 rpm

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Then by formula $N_2 = 330$ rpm And by formula $N_4 = 250$ rpm
Since the gear ratio of dynamo is 24×1 .

Then the rotation of dynamo shaft is 6008 rpm

At 6008 rpm dynamo gives 18-22 volts potential difference.

There are various steps to be followed during the operating condition;

- Water and air ratio=(60:40)
- Given pressure=(85 to 95 psi.)
- Rpm of turbine=(1050 rpm)
- Output = (20-24 volts)

CONCLUSION

The conclusion of our design is to give the electricity generation without using any coffers using pedal work and to avoid or reduce the cost of electricity generation. The main factors we're using "air & water " using pedal work and main motive of this instrument is to make it for domestic purpose and lighting and electrical purpose. This design is completely eco-friendly and there's no critical response over terrain and mortal being and after testing and dimension we can say that it's suitable for domestic purpose and light cargo and it can operate lighter cargo for some time fluently using some pedal work.

Future Work

After taking into attention and going to the process of whole research we arrived at subsequent advantages.

- It can create electricity for local purpose.
- Inexpensive, Cost-effective and Ecofriendly Friendly
- It has not practice any properties so it is inexpensive incost.
- It has not permission any critical consequence over environment and humanbeings.
- It is maximum useful for low load purpose
- It is helpful for human being fitness due to pedal work.

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