

# Power Generation through Gravity and Kinetic Energy

Md.Muqtar Ahmed\*, Heena Naaz\*\*

Department of Electrical and Electronics Engineering, St.Marys College, Hyderabad  
Department of Electronics and Communication, Jyothishmathi College Karimnagar

**Abstract-** Power generation is done through various methods, some of which uses Renewable energy sources and some use Non Renewable Energy Resources. But all this methods can be used to produce the Electrical energy only for some extent. The energy generated from Renewable sources is also not continuous throughout the day for 24hrs. Therefore a source through which energy can be harvested continuously for 24hrs is to be found. Gravity is the force that is present on the earth at every instant of time, hence with suitable mechanism it can be used as a source to generate Electrical energy. An arrangement is made in such a way that the Kinetic Energy of a body due to the gravitational force is converted into electrical energy.

**Index Terms-** Electromagnetic induction, Gravitational force, hydraulic power, kinetic energy.

## I. INTRODUCTION

This paper presents a new Innovative method of power generation using the Gravitational force of our Earth which is present all the time and can be utilized at any place on the Earth. Energy demand is increasing day by day with rapid growth in industrial as well as house hold utilization. But the energy resources are gradually decreasing at a higher rate. With this scenario the energy resources would come to an end within a few years and hence there will be scarcity of fuel (coal, wood, water, etc..) for power generation. The other sources like solar, wind, biomass, etc., are available only for a particular duration of time during the day and the night. Therefore it is the time to look for other resources, or to find a new method to generate power in order to fulfill our Energy demands and requirements.

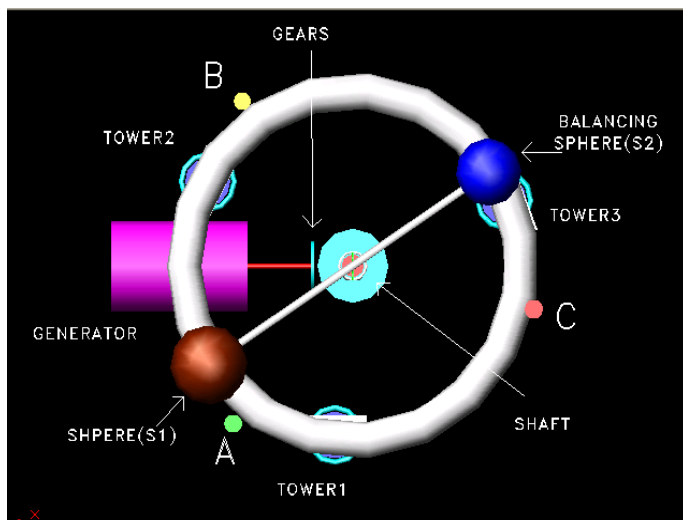


Fig 1: BLOCK DIAGRAM TOP VIEW

But in practice these designs could not be brought into physical body as their functioning did not work as thought theoretically.

Some researchers have been made earlier in this field but they could not be applied successfully due to some limitations. The mechanism employed for harvesting energy from gravity was lacking specifications in various aspects. Some designs were made with the mechanism arranged in an order such that the kinetic energy of solid bodies could be converted into electrical energy.

**Principle:** This machine is based on the simple principle i.e., when an object is placed on a higher level ground then due to the gravitational force it experiences a pull towards the lower level and gains kinetic energy. This kinetic energy can be utilized in a précised manner in which it can be transformed into electrical energy.

**Working:** Two spheres of different weights connected together with a shaft are balanced on another shaft placed vertical to the plane. These two spheres rest on a circular ring type platform which is supported by three hydraulic towers. Initially the two spheres rest at certain angle on the horizontal plane.

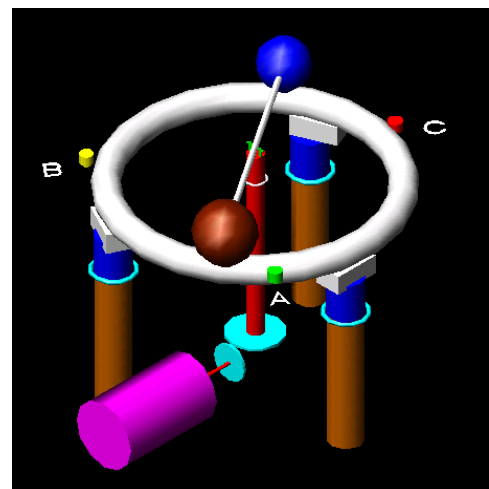


Fig 2: BLOCK DIAGRAM SW VIEW

In this, the power generation is based on the kinetic energy of Sphere  $S_1$  but not that of the other sphere  $S_2$ . The reason for this will be explained in the next chapter.

Let us suppose, the sphere  $S_1$  is at the point A as shown in the fig 2. Then the base of the circular platform at Tower-1 will be raised up hydraulically till the specified height, therefore as the platform is raised up, the sphere above it also rise upwards and therefore due to the gravitational pull of our Earth the sphere tends to move forward in downward motion and hence builds up

kinetic energy. Then the sphere  $S_1$  reaches the point B and therefore the base of the platform at Tower-2 raises up and simultaneously the base at Tower-1 go downwards and hence the sphere  $S_1$  moves further towards the point C. Then again Base of the platform at Tower-3 raises up and simultaneously the base at Tower-2 go downwards, therefore the sphere  $S_1$  moves further in forward clockwise direction and reaches the point A. Then once again the base at Tower-1 rises up and the same process repeats throughout the process. Therefore as the sphere moves, the vertical shaft connected to it also rotates. The vertical shaft is connected to a generator through gears. Hence the Armature of the Generator starts rotating and Electrical power is generated.

There is a big problem with the weight of the Sphere  $S_1$ , the larger the sphere, the heavier it will be and therefore the hydraulic system used to raise the platform base as well as the Sphere  $S_1$  should be of higher capacity. In this case the energy required to raise the tower up will be more than the energy generated and therefore it would be of no use.

This problem is solved by connecting another sphere to the other end of the horizontal shaft. The two spheres  $S_1$  and  $S_2$  are balanced on the vertical shaft such that only 5% to 10% of the weight of sphere  $S_1$  falls on the circular platform. Therefore now when the tower raises up, it has carry additional weight of only 5% to 10% of the sphere  $S_1$ . Hence the power consumed in raising the tower up will be less and therefore this mechanism works with much more efficiency.

## II. LIFTING SYSTEM ELECTRICAL CONNECTIONS:

We can use two methods for lifting up the towers.

1. Hydraulically
2. Electrically

**1. Hydraulically:** Hydraulic lifting arrangement can be done on the top of the three Towers as shown in the Fig 2. With the help of a control unit the raising and lowering of the towers can be controlled till the specified height. The tower must be raised within a short period of time and as soon as the sphere  $S_1$  reaches the next point it must lower down only till half of its raised height. Then when the sphere  $S_1$  reaches 2<sup>nd</sup> point, this tower must completely lower down till its base point. With this process the sphere  $S_1$  can make continuous rotations and hence power can be generated continuously.

**Hydraulic Specification:** When the sphere  $S_1$  reaches the points A,B,C placed after the three towers, the following actions are done.

At point **A:**

1. Tower-1 lifts up completely.
2. Tower-2 lowers down completely.
3. Tower-3 lowers half its raising height.

At point **B:**

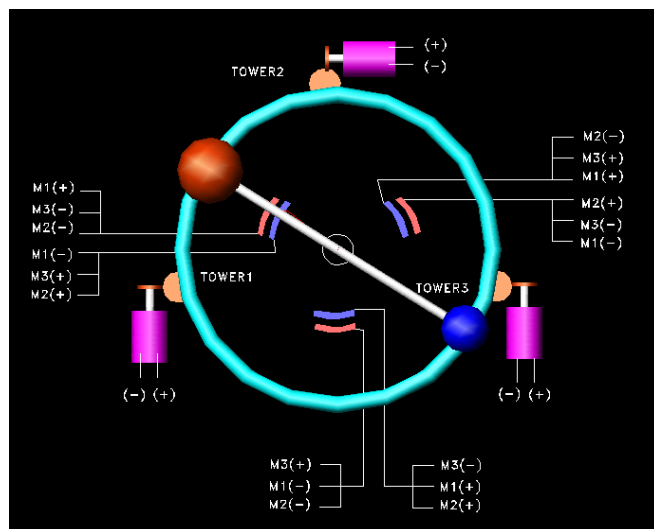
1. Tower-2 lifts up completely.
2. Tower-3 lowers down completely.
3. Tower-1 lowers half its raising height.

At point **C:**

1. Tower-3 lifts up completely.
2. Tower-1 lowers down completely.

3. Tower-2 lowers half its raising height.

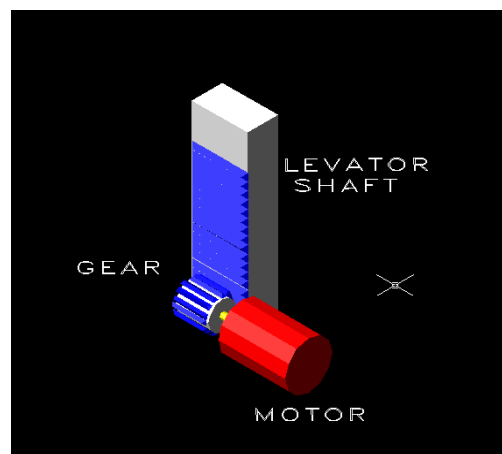
**2. Electrically:** The electrical connections for the lifting system are as shown in the Fig 3.



**Fig 3: HYDRAULIC SYSTEM ELECTRICAL CONNECTIONS**

The mechanism used in lifting and lowering the base part of the tower is as shown in the fig 4.

A rectangular shaft with saw tooth edges on one side is connected to the gear box of the motor as shown in fig 4. Therefore as the motor revolves forward and backwards, the tower shaft moves up and down, thereby lifting up and the base of the platform.

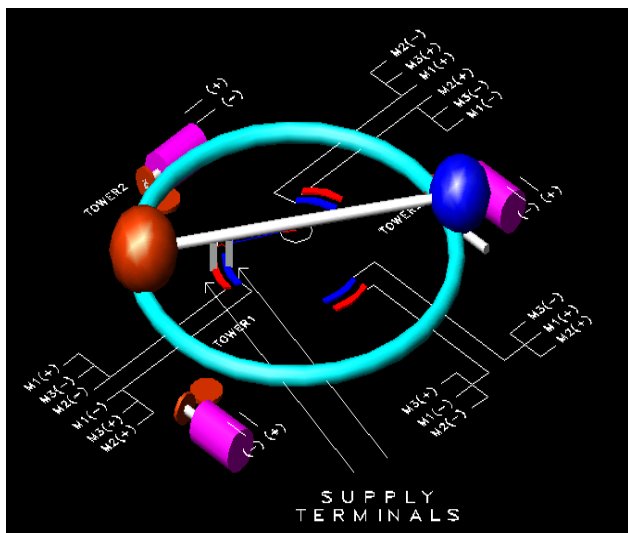


**Fig 4: ELECTRICAL ELEVATION MECHANISM**

The lifting and lowering of the towers must be done in a précised manner. For this operation the motors must rotate clockwise and anti clockwise only for the defined period of time. This means the supply given to these motors should be controlled. This is done with the help of a switching mechanism through which the electrical supply is given to the motors on for a particular duration of time.

For this operation DC motors are used. By changing the polarity of the supply terminals, the direction of rotation of the motor is changed and hence performs the lifting and lower operation of towers.

The electrical supply connections are shown in fig 5. Electrical supply to the motors is fed through the brushes connected to the horizontal shaft in between the spheres. The two brushes connected to the shaft make contact with the metal strips laid along the circular path and serve as supply terminals. Whenever these two brushes make contact with the metal strips, the corresponding motors get activated through the line connection made on the metal strips and therefore perform the desirable task of lifting and lowering of the platform base.



**Fig 5: ELECTRICAL CONNECTIONS SW VIEW**

When the sphere  $S_1$  reaches the points A,B,C placed after the three towers, the following switching operation of the motors is performed.

At point **A:**

1. Motor-1 is in forward direction and lifts up Tower-1.
2. Motor-2 is in reverse direction and lowers Tower-2.
3. Motor-3 is also in reverse direction and lowers Tower-3.

At point **B:**

1. Motor-2 is in forward direction and Tower-2 lifts up.
2. Motor-3 is in reverse direction and lowers Tower-3.
3. Motor-1 is also in reverse direction and lowers Tower-1.

At point **C:**

1. Motor-3 is in forward direction and lifts up Tower-3.
2. Motor-1 is in reverse direction and lowers Tower-1.
3. Motor-2 is also in reverse direction and lowers Tower-2.

### III. CONCLUSION

Therefore compared with the other power generation methods like solar, hydel, wind etc., this method of power generation through kinetic energy produced by the gravitational force is very efficient. As the power generated by this method is available throughout the day. This power unit can be installed at any place nearer to the populated areas as it doesn't require any fuel or supply resources like water, coal, wind etc., for power generation.

### ACKNOWLEDGMENT

We first thank ALLAH for making us able to do this project by his mercy and blessings.

We express our heartiest thanks to our Parents MD.NAZEER AHMED, GOUSIA BEGUM and MD.MUSHEERUDDIN, ATHIYA SULTANA who have been a constant source of inspiration for us and helped us in every aspect, guiding and motivating us in successfully completion of this project.

We extend our special thanks to our family members for their continuous encouragement throughout the completion of our project.

### REFERENCES

- [1] B.L.THERAJA, Electrical Technology, Volume-II, AC & DC Machines, Ed.S.Chand, 2009, pp 887-1030.
- [2] Bunsal, Hydraulics, Radiant publications, 2010.

### AUTHORS

**First Author** – MOHAMMED MUQTAR AHMED, M.Tech Power Electronics, Asst.prof., St.Marys College of engineering and technology.

Email: [muqtar.mtech@gmail.com](mailto:muqtar.mtech@gmail.com)

Ph no: +91-7382600721



**Second Author** – HEENA NAAZ, (M.Tech, VLSI Design), Asst.prof., Jyothishmathi College of Engineering and Technology.

Email: [naz.heenal@gmail.com](mailto:naz.heenal@gmail.com)

Ph no: +91-9059947819

