

A Review Paper on Power Generation through Speed Breaker

Atmiya. M. Patel¹ Prof. Amit. N. Patel²

¹Student ²Assistant Professor

^{1,2}Department of Electrical Engineering

^{1,2}Dr. Jivraj Mehta Institute of Technology, Mogar, Anand, India

Abstract— Nowadays, power is a principle necessity of creating nations. Power is the most imperative piece of nature and it is a standout amongst the most generally utilized types of vitality over the world. [1] This paper exhibits how imperativeness can be tapped and used at a typically used structure the road speed breakers. The number of vehicles disregarding the speed measuring glass in extending each day. In this paper investigated by a spring coil course of action control age and air pressure instrument. In this paper we evaluate the sustainable power sources through age of power. Presently in this paper contrasting with a few techniques and examination of the power age. In this gadget active vitality proselytes to the electrical vitality.

Key words: Power Generation, Spring Coil Mechanism, Piston, Electricity, Conservation and Conversion, Air Compression Mechanism, Battery

I. INTRODUCTION

In this time our reality nearly utilizes greater hardware utilize greater power for its working and interest for the power is expanding in numerous and extensive measure of power require in this time non-renewable energy source is dirty nature. What's more, warm power plant and nuclear power plant requires cautious dealing with and both crude and in addition squander condition and some colossal items and so forth. This power age is a clean and sustainable power source. In paper it is going to utilize sustainable power hotspot for control age. Here every one of the techniques performed are under speed breaker. Furthermore, going through vehicles from speed breaker it creates power. Fundamental points of interest and fate of this techniques is here utilized squandered vitality for control age.

II. METHODS

Here many type of methods use in power generation. Main five system method in paper

- 1) Spring coil mechanism
- 2) Rack and pinion mechanism
- 3) Air piston mechanism
- 4) Roller mechanism
- 5) Air compression mechanism
- 6) Crank shaft mechanism

A. Spring Coil Mechanism

In this instrument spring coil is utilized for making the weight comparable to the vehicle's weight. We outline the spring coil component to such an extent that at whatever point a vehicle approaches the speed breaker it makes compel on spring loop system. Most extreme load on the speed breaker is the point at which the vehicle is on the center of the speed breaker. Because of this power is connected on the cylinder/spring component in the water tank/air tank. And after that water/air is coming outside of the tank. This water/air is passing on rotor sharp edge which pivots & one chain belt is there

so Generator is likewise turns with rotor. This generator creates power which can be utilized for lighting of the lights out and about or it might be put away in the battery and can be changed over in AC current utilizing inverter and utilized for lighting of the lights, signals sign sheets on the road. [3]

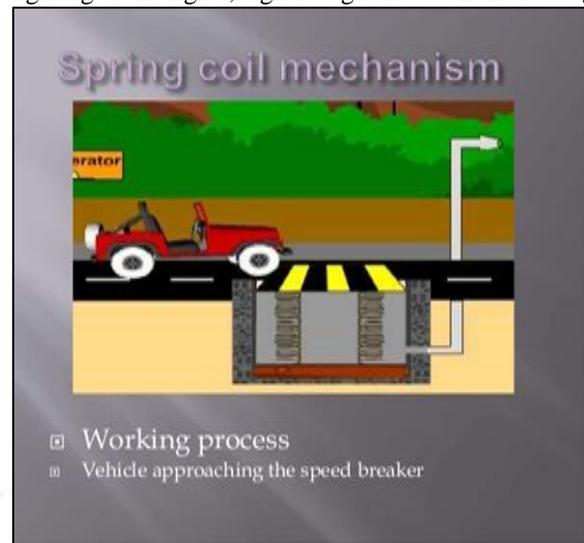


Fig. 1: Spring Coil Mechanism

B. Rack and Pinion Arrangement

There was a noteworthy change in speed breaker age unit. The change was utilizing rack and pinion system in which the responding movement of the speed-breaker is changed over into revolving movement. In this instrument, the best piece of the rack is associated with the speed breaker and the lower part is connected with pinion. As the vehicle ignores the speed breaker the rack moves the descending way which thus turns the pinion clockwise way. The pivot of the pinion is combined with the sprocket plan on the poles. The sprocket course of action is made of two sprockets. One of bigger size and the other of littler size. Both the sprockets are associated by methods for a chain which serves in transmitting power from the bigger sprocket to the littler sprocket. As the power is transmitted from the bigger sprocket to the littler sprocket, the speed that is accessible at the bigger sprocket is moderately duplicated at the turn of the littler sprocket. As the littler sprocket pivots the pole pivots which thus turns the pole of DC engine through apparatus gathering. Likewise, a flywheel is associated on the pole of the littler sprocket in order to get persistent revolution of the pole and in this manner the generator. Therefore, power is delivered when pinion is pivots clockwise way however what happens when the rack moves upward way? In this way the pinion will turn anticlockwise way and wipe out the development of clockwise bearing accordingly diminishing the effectiveness of the general framework. Consequently because of this real disadvantage even rack and pinion component have its own impediments.

A rack and pinion are a kind of straight actuator that includes a couple of riggings which change over rotational movement into direct movement. A roundabout rigging called "the pinion" connects with teeth on a straight "apparatus" bar called "the rack"; rotational movement connected to the pinion makes the rack move, accordingly interpreting the rotational movement of the pinion into the direct movement of the rack. [1]

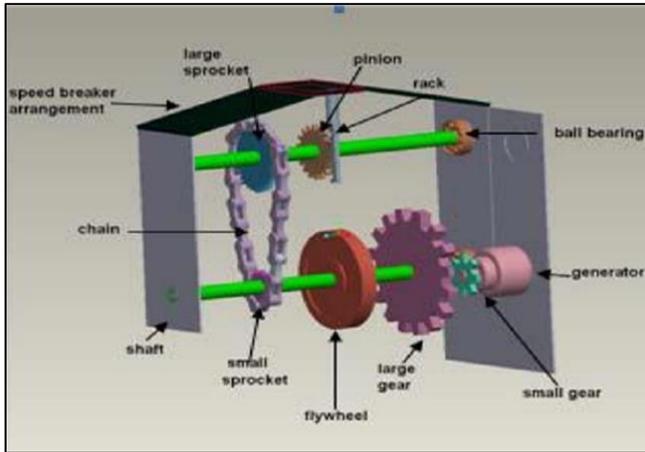


Fig. 2: Rack and pinion arrangement

C. Air Piston Mechanism

Different methodologies were made to create control through speed breakers yet somehow every approach had its own particular confinements. Air cylinder instrument is an alternate sort of approach with high productivity as contrast with past systems. In this, when the vehicle (stack) disregards the bended shape metal sheet i.e. vault, it goes down because of the heap of vehicle. This get together pushes down to the spring. This bended vault is associated with the cylinder by means of interfacing pole. This snappy activity (development of cylinder descending) packs air in the compressor barrel which escapes out (debilitate stroke) from the conveyance valve and it put away noticeable all-around chamber (tank). At the point when the vehicle leaves from the speed breaker, the arch alongside cylinder climbs rapidly because of which the activity of spring permits air admission into the compressor chamber (suction stroke). These means are rehashed with the progressive going of vehicles. The successive here and there development of air compressor cylinder (joined with speed breaker arch) finishes the admission and fumes strokes of the air compressor over and again in this manner turning the pole of the generator. In this way, these rehashed cycles will be conceivable with occupied streets will store a decent measure of pressurized air noticeable all-around chamber that can be additionally used for helpful purposes. Thus, control is produced with most extreme proficiency. However, this set up isn't useful from temperate perspective. [1]



Fig. 3: Air Piston Mechanism

D. Roller Mechanism

In this set up, an iron roller is settled on a wooden incline on which vehicle can go because of which roller pivots toward the vehicles disregarding it. The roller is connected with the pole of DC engine (utilized as a generator) through a chain and sprocket course of action. Presently as vehicle ignores it; the roller turns the pole of the DC engine in this way delivering power. Henceforth DC control is creating through the roller system which can be put away in the battery and utilized for some time later. The benefit of this system is that power can be generally delivered in a basic way without contaminating nature. Be that as it may, quality and misfortunes are the constraints of this technique which is to be considered. [1]



Fig. 4: Roller Mechanism

E. Air Compression Mechanisms

In this strategy when vehicle go from the speed breaker the cylinder of the pump is goes down and air is packed. The accompanying figure indicates air pressure instrument. This packed air has some speed so we can utilize it to pivot turbine. The tank is accommodated the more pressure and capacity of air it isn't vital if a power by the pump is high. The air goes

into the turbine which is associated with the alternator or any kind of electric generator so we can produce power. This technique is required less upkeep and furthermore minimal effort, here nonappearance of some other rotational parts diminishes misfortunes. The explanation behind select this strategy is, it is relevant for developing pace breakers which can produce power. The cost of development is less and effectiveness is high. The fundamental issue in different components is steady yield on the grounds that there is just a single approach to store vitality is battery. In this component stockpiling of air is additionally conceivable, so it can give consistent yield for longer timeframe than some other mechanism. [2]

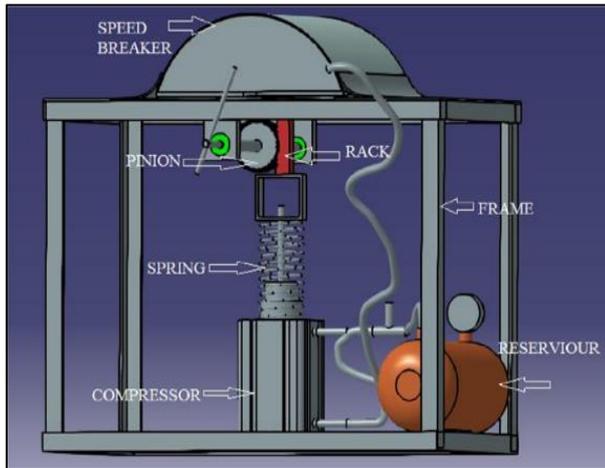


Fig. 5: Air Compression Mechanism

III. COMPARISON

Parameters	Spring coil	Crank shaft mechanism	Air compression	Roller mechanism	Rack and pinion mechanism	Air piston mechanism
cost	Low	High	Low	cheap	Moderate	Costly
Mechanism setup	easy	Very hard	easy	Very easy	difficult	Very difficult
maintenance	More less required	Very high	Low	Less required	Weekly basis	Daily basis
Adjustable	Yes	Yes	Yes	None	Yes	Yes
Design	Very easy	Very hard	Easy	Easy	Depends upon weight	Depends upon air pistons

Table 1: Comparison

IV. APPLICATIONS

- These types of methods are use in all highway. [3]
- This all type's mechanism of generating power can be placed on proper place speed breaker on the road. [3]
- This generating power used many places after convert into A.C forms using through inverter. [3]
- All types of mechanisms are connected to batteries because vehicles pass through and generating power and store to batteries. [3]
- To provide electric power in small village near to highway. [1]
- Use in highway street light, in toll booths. [1]

V. BENEFITS

- Eco – amicable: In this component no contamination is made.
- No fuel utilized: In control plants there is petroleum product is utilized i.e. coal, diesel, gas, and so on however in this system no fuel is utilized.
- Maintenance: Less support is required for this framework. The fundamental preferred standpoint of this component is there is no any rotational parts like wrench shaft system and rack and pinion instrument likewise no rigging is required. Along these lines, it requires less support.
- Operation: Operation is simple and easy to see so less.
- Adjustable: Here we can likewise utilize flexible hindrances so it can without much of a stretch move and transport to any area, so site determination issue isn't so much critical.
- Cost: Running expense is free in light of the fact that there is no fuel is utilized, and furthermore less establishment cost is required, less upkeep cost, so all finished cost is less.
- Energy accessible all year around [2]

VI. CONCLUSION

In this review paper I conclude that many methods in generation of electricity by speed breakers. But spring coil method and air comprising methods are easy, reliable, low cost and low maintenances. This method is totally based on new concept as up till now only mechanism of spring is used for hydraulic oil and air pressure method.

VII. UNIQUE FEATURE

In spring coil method use air and also water. Use water for generation through speed breaker. Also, there is water recycling process in this project so the water used can be used further again and again. Also, there is natural flow of water.

REFERENCES

- [1] A Review: Comparison of different Mechanisms for electricity generation using speed breaker.
- [2] (Multidisciplinary journal of research in engineering and technology volume 1, issue 2) Power generation from speed breakers by Air Compression method. (© 2015 IJEDR | Volume 3, Issue 2 | ISSN: 23219939 IJEDR1502015International Journal of Engineering Development and Research www.ijedr.org)
- [3] Eco Friendly power generation through speed breaker. (International Journal & Advance Research in Engineering, Science & technology e-ISSN: 2393-9877, p- 2394-2444 volume 4, issue 4, April- 2017)
- [4] Some web site prefers to review
www.ieee.com
www.google scholar.com