



INSPIRE 2015

SPSR NELLORE DISTRICT

WRITEUP OF THE PROJECT

Warrant Number : 14AP01044127

Name of the Project : POWER GENERATION NEAR SPEED BREAKERS

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Name of the Division : KAVALI



A BRIEF WRITEUP ON THE PROJECT

The project that we have under taken is generation of power near speed breakers. Concept behind the project is piezo electric effect.

In general, speed breakers are arranged where the vehicles needed to go with care i.e., at schools, super speciality hospitals, toll gates, junctions...etc. All these places need lighting. Piezo electric crystals can produce required power.

These piezo electric crystals works on the principle of piezo electric effect. The phenomenon of generation of small voltage when mechanical stress is applied is called "Piezo electric effect."

When vehicles pass through speed breakers { with piezo electric crystals) crystals get compressed. Mechanical stress produced by vehicles generates voltage. Power so generated can be used for various purposes.

This concept can be further used to detect collapsing of bridges.

POWER GENERATION **NEAR SPEED BREAKERS**

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Index

S.No.	Topic	Page No.
1	Aim and Objectives	2
2	Introduction	3
3	History	4
4	Theory	5
5	Required materials	6
6	Step by step procedure	7
7	Observations and Applications	8
8	Conclusion	9
9	Acknowledgement	10

Aim:

To generate electricity near speed breakers using piezo electric crystals.

Objectives:

To have Lighting near hospitals, schools, junctions etc... where ever speed breakers are present.

Introduction:

Man needs energy at an increasing rate from day to day. Due to this a lot of energy resources have been exhausted and wasted. The utilisation of wastage of energy near speed breakers may reduce scarcity to some extent. If the energy wasted near speed breakers can be made possible for utilisation, it will be great invention.

In this project I am generating electric power near speed breakers when ever vehicles pass through them. Mechanical stress applied by wheels of vehicles can generate Voltage. This project uses piezo electric effect for this purpose.

History:

My school is located in Duttalur of SPSR Nellore district. Duttalur is a junction where four roads meet. Speed breakers are located in all four directions. When I am waiting for a bus to my village, I had seen many cars, buses, lorries coming with very high speed gets slow down and after crossing speed breakers they speed up.

My father used to say if we change gears of vehicles fuel gets wasted. I was thinking Is there any way to utilise the power wasted near speed breakers? When I discussed about this with our teacher he said about piezo electric effect. He said that we can produce power near speed breakers as vehicles are exerting large pressure. Our discussion, hard work resulted in this project.

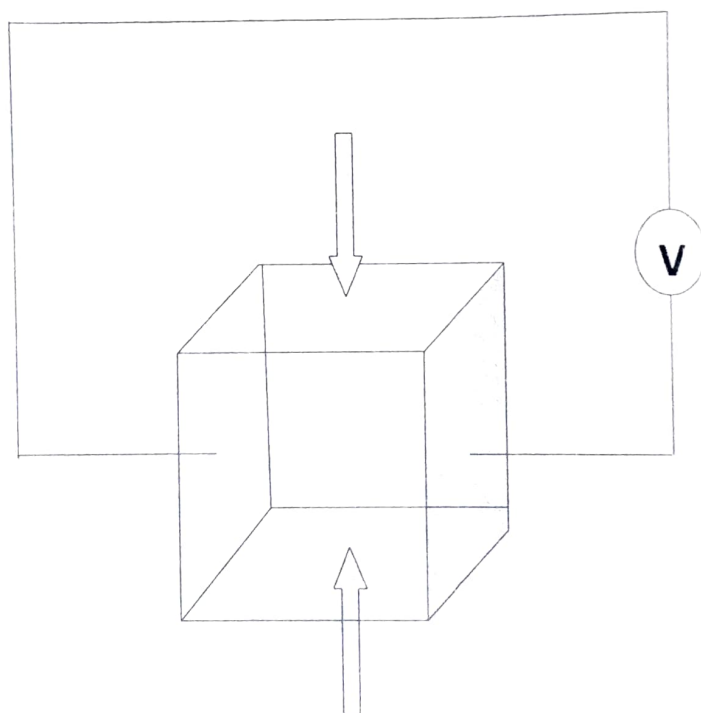
Theory:

The phenomenon of generation of electric voltage when mechanical stress is applied on certain crystals is called "piezo electric effect". The electricity that produced is called piezo electricity.

Crystals which exhibit piezo electric effect are called "piezo electric crystals".

Piezo electric effect was discovered in 1880 by Jacques and Pierre curic brothers. The word piezo is derived from Greek word Piezein means to squeeze (or) press.

They found that when mechanical stress is applied on certain crystals like Tourmaline, topaz, quartz, electrical charges appeared .This voltage was proportional to stress.



Mechanical stress.

Required materials:

1. A card board of dimensions 50 cm x30cm.
2. Pieces of wood
3. Piezo electric crystals (quartz)
4. A battery
5. A switch
6. Dry battery.
7. Inverter circuit.
8. Bulb
9. Connecting wires.
10. LED bulb.

Step by step procedure:

1. A card board of about 50 cm length and 30cm breadth is taken. Pieces of wood is placed on it so that they appear as breakers on the road .
2. Fix piezo electric crystals on the speed breakers.
3. All piezo electric crystals are connected in series and this is connected across a battery.
4. To identify the generation of voltage LED is connected.
5. The output of battery is given to Inverter circuit through a switch.
6. Output of filter circuit is connected to lights.

Observations:

1. When we tap with our hands on piezo electric crystals, a small voltage is developed.
2. Generation of voltage is observed by the lightening of LED.
3. The voltage so generated is stored in the battery.
4. Output of battery is connected to the lights through switch and inverter circuit,
5. The purpose of inverter circuit is to convert DC power into AC power.

Applications:

1. Power can be generated near speed breakers.
2. Collapsing of bridges can be detected.
3. Automatic switching on of gas stove without match stick.

Conclusion:

Power can be generated near speed breakers. This power can be used for lightening. Since this power is generated using mechanical stress we are generating the power at no cost. No maintenance is required. This is one of the sources of alternate energy.

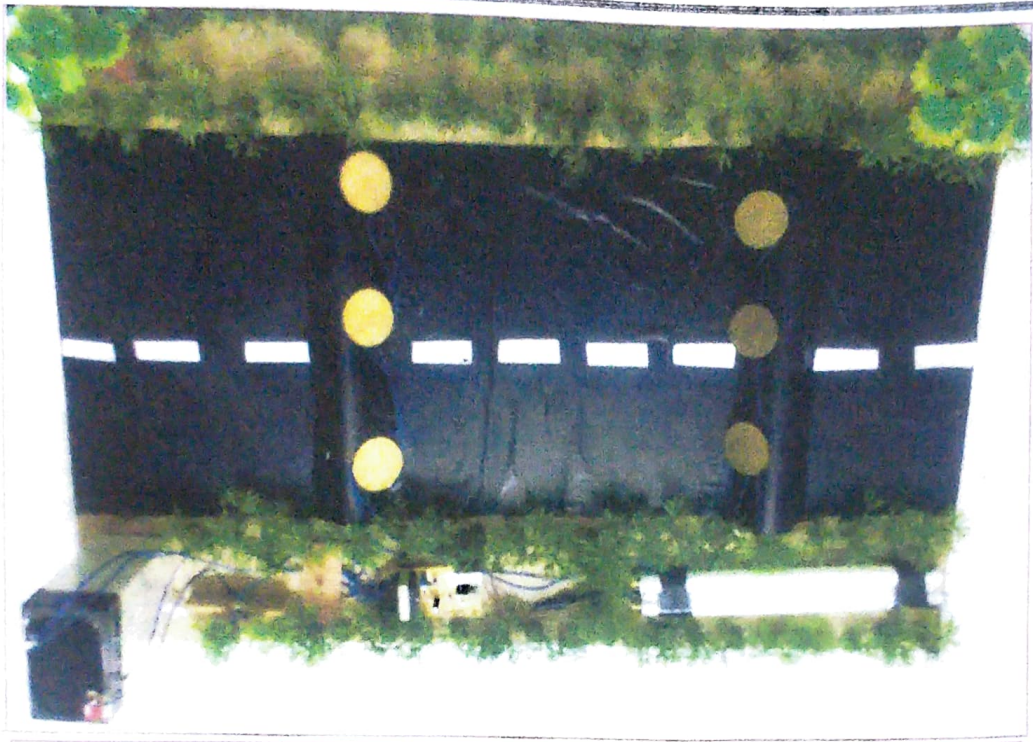
Acknowledgement:

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I really thank our principal K.Sarada Kumari for her support and encouragement.

I also thank my parents for giving me permission and encouraging me to complete this project.



Name of the Project

POWER GENARATION NEAR SPEED BREAKERS