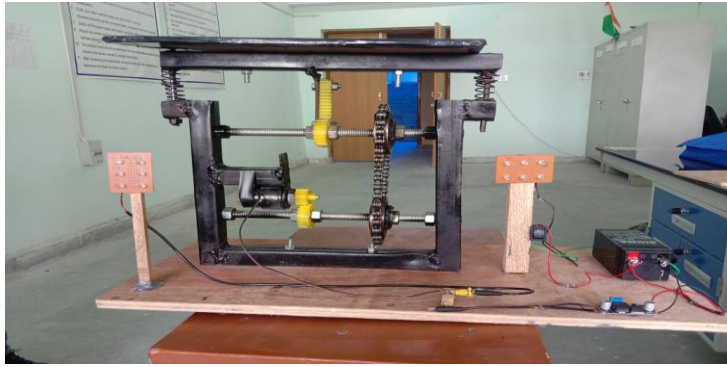


## **ELECTRICAL POWER GENERATION USING SPEED BREAKER**

**AIM:-** Electricity is generated by replacing the usual speed breakers with some simple mechanism. As vehicles pass over the speed breakers, rack and pinion mechanism works and with the help of high tension springs in turn generate electricity. This method is an effective way to produce electricity as the number of vehicles is ever increasing. It can be effectively placed near toll plazas, parking lots and other locations where density of vehicles is very high. A rack and pinion, spring assembly mechanism is provided which transfer the motion to a DC motor/generator for electricity generation. This method provides a cost effective way to generate electricity from the mechanical energy of dynamic vehicles on roads.

**INTRODUCTION :-** A large amount of energy is wasted by the vehicles on the speed breakers through friction, every time it passes over it. Energy can be produced by using the vehicle weight and speed. So here we propose a smart speed breaker that generates power. The reciprocating motion of the speed breaker is converted into rotary motion using the rack and pinion arrangement. We design a smart speed breaker that can pass vehicles coming from both sides and yet generate energy from it. The system makes use of mechanical assembly with metal sheets with linkages that press down with spring arrangement. The system makes use of the speed breaker press and then uses a rack and pinion arrangement to press down and run generator motor thus generating energy. The spring mechanism is the used to drive the speed breaker back into original position. It converts rotary motion into linear motion, but sometimes we use them to change linear motion into rotary motion. This mechanism is very economical and easy to install. By doing proper arrangements we may generate high power electricity from road traffic.



## COMPONENTS

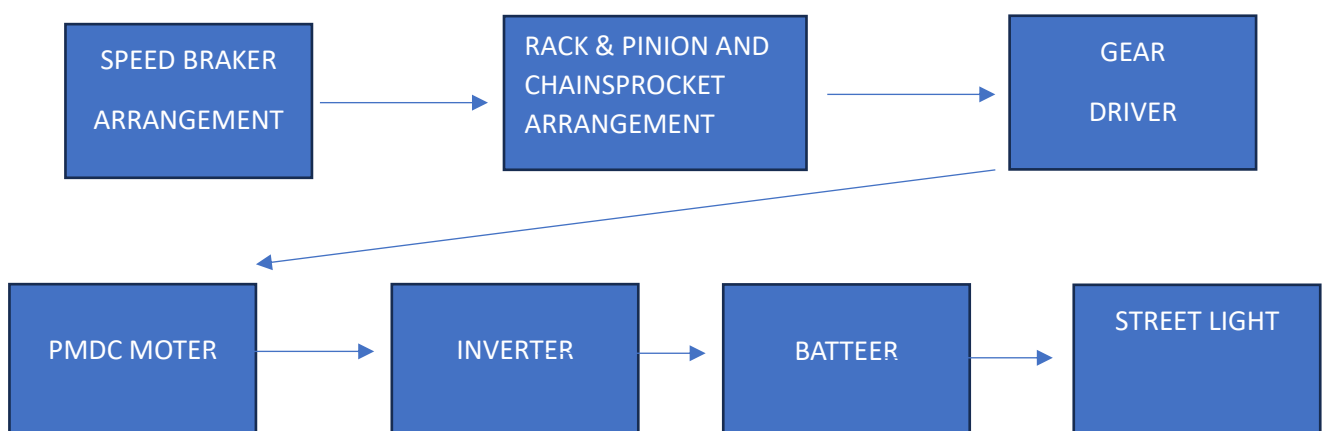
1. Frame
2. Hump
3. Spring
4. Rack & pinion gears
5. Shaft
6. Sprocket
7. Close helical spring
8. PMDC Motor
9. Battery

**METHODOLOGY :-** The working principle of this power generation program is to convert the kinetic energy to electric energy via mechanical energy. This can be done when the brakes are applied upon the vehicle kinetic energy is produced. After this the kinetic energy is converted to mechanical energy using a rack and pinion gear and the by connecting the pinion gear to a generator shaft the energy is converted into electrical energy

1. **Speed Breaker:** This is a commonly used traffic calming device, but in this context, it's being repurposed to capture kinetic energy from passing vehicles. To withstand the heavy loads of vehicles, the speed breaker is constructed from a composite material, combining carbon fiber and rubber. It consists of a central section made from this composite material and sloped ends made from concrete and cement.

2. **Kinetic Energy Conversion:** When vehicles pass over the speed breaker, the composite central section flexes and stores some of the kinetic energy from the vehicle's motion.
3. **Rack and Pinion Gear:** This component is designed to convert the stored kinetic energy into mechanical energy. It consists of two parts: the rack, which is a straight gear with teeth in one direction, and the pinion, which is a round gear. The pinion rolls along the rack, transferring mechanical energy to the next stage.
4. **Generator:** The pinion gear from the rack and pinion arrangement is connected to a generator's shaft. As the pinion gear turns with the motion from the rack, it rotates the generator's shaft. The rotation of the generator's shaft induces an Electro Motive Force (EMF) within the generator, which generates electrical energy.
5. **Electricity Storage:** Electrical energy generated by the generator can be intermittent, so a battery pack is introduced to store and stabilize the electricity. Battery packs are useful for storing energy for later use or for transferring it to other locations.

## BLOCK DIAGRAM



## **ADVANTAGE**

1. Low budget electricity production, since the setup has simple parts such as chains sprockets and springs.
2. As the construction type is concerned that there is no damage to vehicles and no obstruction of traffic.
3. It is easily maintained by painting the setup by anti rusting paint and oiling it frequently so total maintenance charge is less.
4. It is suitable at parking of multiplexes, malls, toll booths, signals etc. since it takes more time to move a certain distance, therefore when the power ramp is fixed in a crowd area so power can be generated.
5. Uses: charging batteries and using them to light up the streets, etc.
6. The power is fixed firmly to the ground and the construction is designed by the exact dimensions required therefore less floor area can be used.

## **DISADVANTAGE**

1. Since the power consumption depends upon the transmission of vehicles each selection of springs, such that it should withstand the weight of the vehicle.
2. Achieving proper balance of speed and torque.
3. It gives low electric output.

**ROLE:-** I am work as team leader and design the project model .

**PROJECT GIVE:-** An energy crisis is any great bottleneck (or price rise) in the supply of energy resources to an economy. An energy crisis may be referred to as an oil crisis, petroleum crisis, energy shortage, electricity shortage electricity crisis. Our project emphasized on creating a renewable source of energy using

speed breaker. One might conclude that to be materially rich and prosperous, a humanbeing needs to consume more and more energy. And this project is best source of energy that we get in day to day life.