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The Green Energy Train

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A B S T R A C T

We might conclude that the world today is heavily dependent on fossil fuels and other conventional energy sources if we look at the situation from a global perspective. Therefore, it becomes vital to discover an alternative to daily life applications that depend on non-renewable energy. It has to be replaced with a device that serves the same purpose and uses renewable energy. a train powered by solar energy. The battery stores this solar energy to ensure that trains can run at night as well.We suggest a power delivery system suitable for mass transit. The trains in this system have solar panels placed on their roofs. On the roof, we offer solar panels. Our working model is making a statement that utilization of solar energy is quite a simplified for the modern days. Exploration of this kind of working model will definitely help for the encouragement of utilization of solar energy.

Keywords: solar energy, battery, renewable energy

1. INTRODUCTION

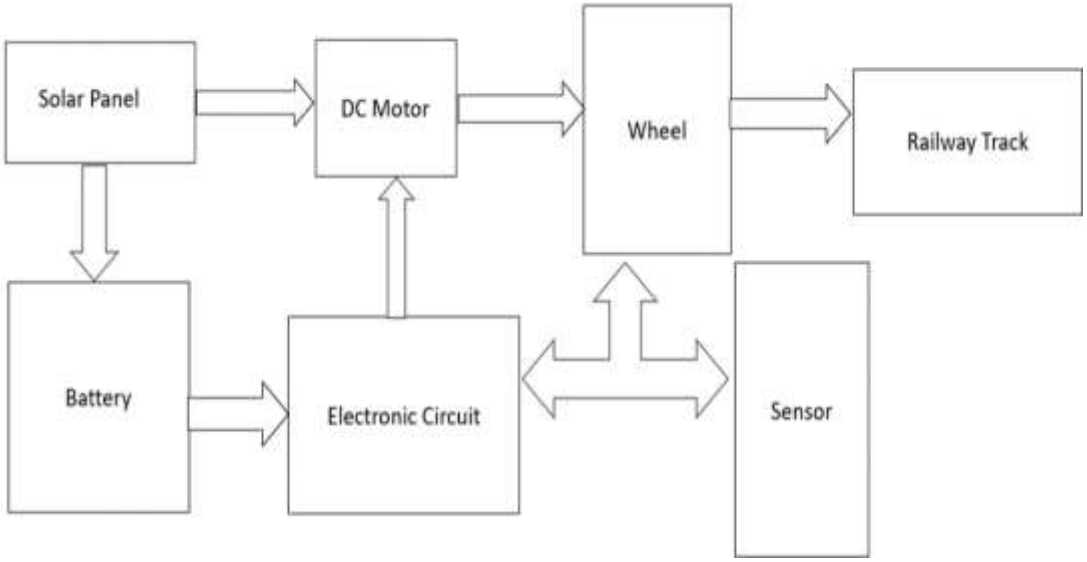
A train powered by solar energy. In order to keep a train running at night, this solar energy is stored in the battery. The two motors located on the train's rear wheels as well as a battery are integrated into the single solar panel's total load calculations so that they can operate simultaneously. There are many ways to use solar energy, and we're attempting to make a point about SOLAR TRAIN in all of them. We have determined the calculation for the area of the solar panel needed for the specific weight of the TRAIN. We used some of the same approaches in this procedure.

Solar energy is the name given to radiation from the Sun that can ignite chemical reactions, produce heat, or create electricity. The total solar energy incident on Earth is far greater than the global energy needs at the moment and in the future.This highly distributed source has the ability to meet all future energy demands if properly exploited. Due to its limitless supply and lack of pollution, solar energy is predicted to become a more appealing renewable energy source in the twenty-first century than the finite fossil fuels coal, petroleum, and natural gas.

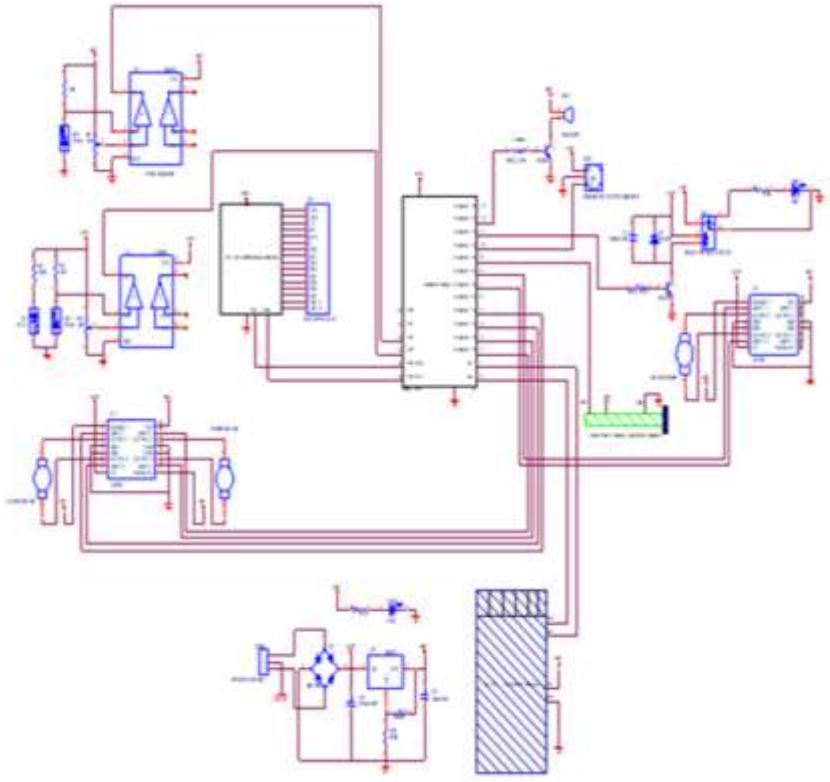
2. COMPONENTS

Sl. No	Components	Quantity
1	Arduino Nano	1
2	IR Sensor	2
3	DC Motor	2
4	Motor driver	2
5	LM317 Adjustable regulator	1
6	LCD Display	1
7	Metal sensor	1
8	Flame sensor	1
9	Battery	1

3. BLOCK DIAGRAM



4. CIRCUIT DIAGRAM



5. METHEDOLOGY

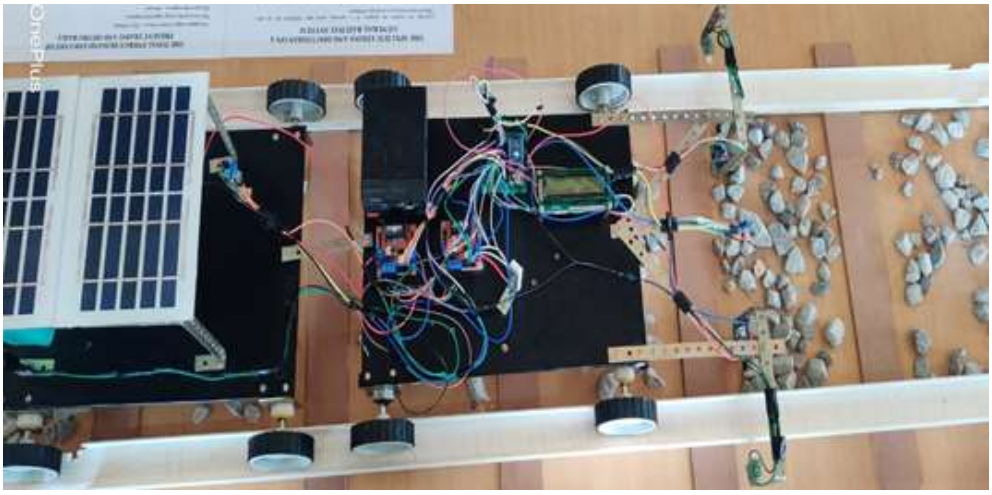
The solar panels are fit upon the rooftops of the sections of the train ,all of these are integrated and brought to the main engine.The solar power obtained would be used by the dc motors in the engine to move the train.The train gets some additional safety features like track crack detection, Bomb detection,Smoke and fire circuit breaker , water sprayer in case of fire ,automatic door opener with remote location.The stations are designed to run on renewables and some amount of power is tapped if in case needed.

6. HARDWARE IMOLEMENTATION AND RESULT

Impressive findings emerged from the study of the solar-powered train's safety measures.The solar-powered train was put through a number of tests and evaluations using industry-recognized procedures to determine its level of safety. To assess the effectiveness of its safety features, the train was put through both simulated and real-world scenarios. The specific safety features that were looked at included metal detection to spot potential track obstructions, fire sensors to detect and put out fires, and train track detection to prevent derailments.

The innovative railway track detection systems on the solar-powered train made use of a number of sensors. These devices successfully located and tracked the train in real-time, ensuring that it stayed on the intended tracks. High precision and responsiveness were displayed by the railway track recognition feature, effectively preventing derailments and assuring safe operation.

Highly sensitive fire sensors were strategically positioned throughout the train as part of the safety system. These sensors kept an eye out for any signs of smoke or fire. The fire sensors quickly identified simulated fire incidents throughout the tests, setting off the necessary warnings and starting the fire suppression procedures. The prompt response of the fire sensors improved passenger safety by helping to reduce fire-related incidents.



HARDWARE IMPLEMENTATION

7. CONCLUSION

Recently, the UK unveiled the first solar-powered railway track in theworld, opening up new possibilities for the adoption of this technology on lines around the globe. How effective is this model, and could our railroads ever function solely on solar power, given notable instances of similar ongoing projects in Australia and India? Due to the global environmental problem, every industry must do its part to reduce emissions and slow down climate change.In this regard, the railway sector benefits from having one of the most environmentally friendly modes of transport on the market and contributing only a small portion of world emissions as a starting point. However, as time passes and nations scramble to cut their carbon footprints.

Numerous initiatives around the globe are already demonstrating that there are effective carbon-free alternatives; concepts like hydrogen trains and network electrification are rapidly gaining popularity.Solar power is beginning to demonstrate significant potential in addition to the world's first solar-powered train, which began operating in the UK in August of this year.Photovoltaic panels near or on rail tracks can provide enough electricity to start a traction current that will be sent to the grid, which is how solar-powered trains are typically propelled.These technologies could offer networks that currently heavily rely on grids a number of economical advantages.

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