



PROVIDING AN ECO SECURED ELECTORAL SUCCESS OFFENCING BY USING RENEWABLE ENERGY

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ABSTRACT

In order to protect the region from trespassers, this article intends to provide security using a solar-powered electric fence. Today, everyone's top priority is to ensure the protection of their property, crops, colonies, industries, etc. Security has become a significant topic. One of the best solutions for providing security is solar fencing, a modern and unorthodox technique that is both effective and efficient. Solar fencing employs sustainable solar energy to operate while also ensuring the security of one's property. Therefore, we have suggested an electric fence type for our college's security. The solar panel, solar charge controller, battery, energy source, and bare conductor for the fence make up the suggested model. The energiser takes 12V DC supply and gives 1 Kvp AC supply at 1/5000th second of impulses for the electric fence.

Keywords: PV panel, energiser, solar fence, electric impulse, maximum power point tracker.

INTRODUCTION

As is well known, electricity is necessary for human life in all spheres. The energy used in this situation serves as security against intruders. Here, solar energy, or energy from the sun, is the mode of energy production. India is incredibly fortunate to have access to renewable energy, particularly solar energy. The majority of the year, there are about 300 sunny days that can be used to generate energy utilising solar modules. The sun emits $3.7 * 10^{26}$ watts of energy into space, of which the planet receives $1.7 * 10^{17}$ watts. The world's annual energy usage is equal to the energy that the sun emits in just three minutes. The uncertainty of water is an offsetting factor in developing of solar energy for power generation. More projects are going on in India for maximum utilization of solar energy in power generation, so that the conventional mode will less utilized. However solar energy devices are dependent on the availability on the sun. Dilute nature of energy, weather dependence, geographical dependency, low efficiency, storage problem, high cost as well as requirements of special types of building infrastructure and need of larger areas for bigger solar energy conversion plants are the problems faced by solar energy utilization. These problems are very environmental related and hence their proper solution be found to maintain the sustainable development with the raising use of solar energy. Now a days land owners are facing issues regarding security as trespasser's are entering without their knowledge and causing harm / damage, moreover in the fields farmers are also facing problems. A photovoltaic cell (PV cell or Solar cell) is a specialized semiconductor diode that converts visible light into direct current (D.C). Some PV cells can also convert infrared (IR) or ultra violet (UV) radiation into (DC) electricity. As we know the solar energy is non-polluting and easily available abundantly so here the solar energy is used for the electric fencing.

LITERATURE SURVEY

Electric Fencing using solar energy in the security of livestock in Brazil: Nowadays the use of electric fence for control and content livestock are having a large application in almost all countries of the world. Electric Fence was starting to use in the thirties and nowadays is used in all world in little and big farms. Brazil, like the major exporter of beef cattle is a great consumer of this technology. Big farms with large areas of control need electric fences energizers of large capacity to keep high voltage in all its extension. But not much

information about safety use and project is presented in papers and available for consumers and manufacturers as well electric fences characteristics. There are in Brazil many manufacturers of this kind of equipment, but these manufacturers use empiric rules to design this kind of equipment's. This work intends to be a starting point to change this reality involving the academic researchers in the study of this problem.

THE PROPOSED SYSTEM AND THEIR OPERATION

An electric fence is a barrier that uses electric shocks to deter animals or people from crossing a boundary. The voltage of the shock may have effects ranging from discomfort to death. Most electric fences are used today for agricultural fencing and other forms of animal control, although it is frequently used to enhance the security of sensitive areas, such as military installations, prisons, and other security sensitive places; places exist where lethal voltages are used.

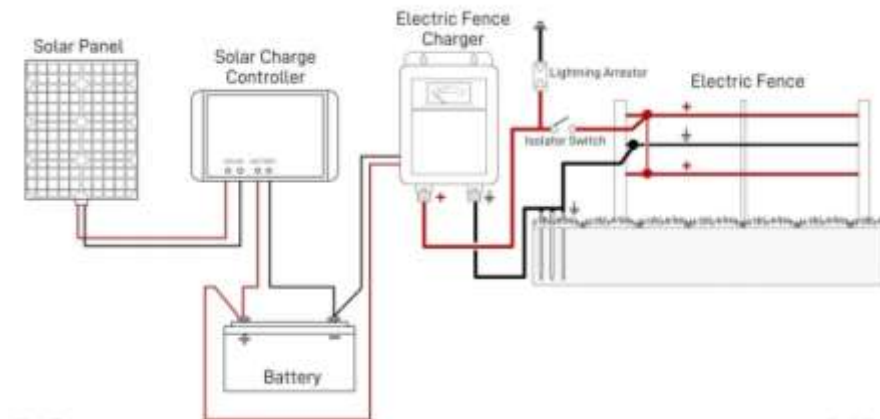


Fig 1: Solar Fence Block Diagram

The proposed system consists of a Solar panel, Solar charge controller, Battery, Electric fence charger, Insulator switch, Lightning Arrestor and Electric Fence.

The working of a solar fencing system starts when the solar module generates direct current (DC) from sunlight which is used to charge the system's battery. Depending on sunlight hours and capacity, the system's battery can generally last for as long as 24 hours in a day. The output of the charged battery reaches the controller or fencer or charger or energizer. When powered, the energizer produces a brief yet sharp voltage. The primary function of the energizer is to produce pulses of nearly 8000 volts that are sharp and short-lived. These pulses are passed through the wires of the fencing system at a rate of around 1 pulse every 1-1.5 second with every pulse lasting for nearly 3 ms, thus ensuring that no physical harm is caused to the intruder who attempts to come in contact with the solar fence.

MAIN COMPONENTS AND THEIR OPERATION

SOLAR PANEL:



Fig 2. Solar Panel

The direct conversion of solar energy into electrical energy by means of the photovoltaic effect, that is the conversion of light (or other electromagnetic radiation) into electricity. The photovoltaic effect is defined as the generation of the electromotive force as a result of the absorption of ionizing radiation energy conversion devices which are used to convert sun light to electricity by the use of the photovoltaic effects are called solar cells. A single converter cell is called a solar cell or more generally photovoltaic cell and combination of such cells, designed to increase the electric power output is called a solar array. Photovoltaic cells are made of semiconductors that generate electricity when they absorb light. As photons are received, free electrical charges are generated that can be collected on contacts applied to the surface semiconductors. Because solar cells are not heat engines and therefore do not need to operate at high temperatures, they are adapted to the weak energy flux of solar radiation, operating at home temperature. These devices have theoretical efficiencies of the order of 25%. Actual operating efficiencies are less than and decrease fairly rapidly with increasing temperature. The most highly used photovoltaic cell is Silicon cell. The silicon cell consists of a single crystal of silicon into which a doping material is diffused to form a semiconductor. Since the earlier day of solar cell development, many improvements have been manufactured with areas 2x2cm, efficiencies approaching 10% and operating at 28° c. The efficiency is the power developed per unit area of array divided by the solar energy flux in the free space (1.353KW/m²). Silicon is the one of the earth's most abundant materials, it is expensive to extract and refine to the purity required for solar cells. The greater barrier to solar cell application lies in the costs of the cells.

ENERGISER:



Fig 3. Energiser Circuit



A Fence charger or energizer is equipment which is used for charging (electrifying) a fence or a boundary in order to protect the inside premise from human or animal interventions. Since these boundaries are mostly of large fields and parks, are normally away from the main cities, and powering them through some renewable option becomes more suitable than from utility grids which may become difficult to acquire in such remote areas. The circuit of a solar electric fence charger explained here does not depend on traditional power source for operating, rather gets it 24/7 from self-sustained solar power conversion set up. A fence charger circuit is basically a switching circuit which involves a few diodes and a high voltage capacitor. When this voltage reaches a particular threshold, the SCR fires and discharges the entire stored voltage inside the capacitor. The above discharging of the capacitor is done or rather dumped inside the primary section of an auto mobile ignition coil. The sudden dumping of the above high voltage inside the ignition coils primary, steps up the surge into several thousands of volts into secondary winding of the ignition coil. This stepped-up voltage is used for energizing the fences appropriately. However, the above operation requires an AC input at the levels of 100 to 200 volts. This voltage is by suitably processing the input DC from a solar panel set up. The voltage from the solar panel is first controlled to a suitable level and then it is used for operating circuit. The triggering circuit consists of an oscillator which switches the voltage obtained from the solar panel controller into the transformers input. So, that the output from the transformers generates the required 220 volts AC for powering the ignition circuit.

CONCLUSION

However, given the damage that people and animals have done to the aforementioned landowners, colleges, the military, agriculture, and farming are now risk factors. Animals are posing a threat to farmers who are cultivating crops because they enter farms when the crops are ready for production and consume or destroy the harvests, causing huge losses. Trespassers also pose a threat to the particular country or land. Therefore, this mechanism will defend the property from trespassers. Protection will be offered by the fencing around the property. In conclusion, the system is affordable and simple to use to ensure security.

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