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Charge Discharge Analysis of a 12-Volt Battery using Radiant Battery Energizer

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Abstract: In any electrical system efficiency is a key parameter. Efficiency strictly depends on system losses. Generally,batteries are charged by conventional methods like Solar/Photovoltaic charging or alternatively they can be charged using Electrical Supply and then the available stored power can be reused when required. This paper is focused on free battery charging based on radiant energy, which is produced as a result of making and breaking of magnetic dipoles in form of high voltage spikes. Initially the rotor requires a kick, then it attains a fixed synchronous speed and rotates almost indefinitely.Making and breaking of dipoles results in high voltage spikes which allows charging of a number of batteries connected in parallel without any cost. The charged batteries can be used directly to feed DC load or with an inverter circuit to feed AC load. The charging time of batteries is 200 minutes, whereas the effective discharge time is around 170 -180 minutes. Though a gap of 20-30 minutes exists, but as multiple batteries are charged at a time; the system works effectively at very high efficiency.

Keywords: Free Battery Charging, Radiant Battery Energizer, Battery Charging using Radiant Energy

1. INTRODUCTION

A system that charges batteries powers electrical loads using concepts originally presented by Nikola Tesla, but which have recently appeared on the alternative energy research scene driven by today's rapidly deteriorating energy situation. The aim is to design and implement a system that provides electrical power at low running cost and is a reliable standalone backup power source which could cater to the energy woes of the country. The mechanism which we adopted for charging batteries was introduced by Nicholas Tesla and pursued by John Bedini in (1901). It is an efficient use of DC source (battery) by repeatedly charging it, combined with DC/AC converter for production of AC power. The prime purpose was to have a prototype that provides battery charging. It would be a self-sustaining system capable of charging a series of batteries, which would be able to supply a small dc load. The DC/AC converter would convert the dc power into ac power that smoothly runs small ac loads continuously. Basically, this idea was conceived from UPS, where battery is being charged by the DC source, by converting AC voltage to DC voltage with the help of AC/DC converter. Our system does not require an AC source. This methodology of charging comprises of, a permanent magnet, which is moved in front of a coil, making it as an electromagnet, as a result of changing magnetic flux. The poles of the electromagnet are formed in such a way that it repels the permanent magnet. As permanent magnet is repelled from the vicinity of the electromagnet, thus there is no induced current in the electromagnet, and the dipole formed dies out. As the dipole collapses it gives birth to a high voltage spike, that voltage spike is discharged in the dead batteries, which makes it charged. The whole idea is to increaseEfficiency of the system and to make sure that power is available anytime.

2. MATERIALS AND METHODS

2.1 Technical Background

A dipole when formed, stores energy in its magnetic field. Breakage of that dipole gives birth to a High Voltage spike, that is the main source of charging dead(discharged) batteries.The Physical model consists of 6 pairs of ceramic grade five magnets of dimension 2 x 1 x 0.25 inches, a total of 12 such magnets. In addition to this there are 3 electromagnets, which are not part of rotor.This design include successive creation and destruction of a dipole that generates the High Voltage spike. The energy concerned with the spike is known as radiant energy.

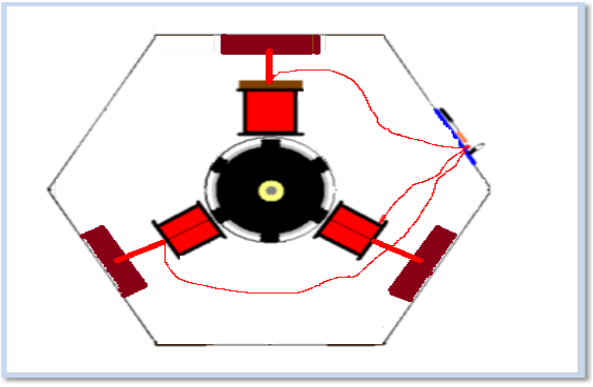

Fig. 1: Top View of Physical Model

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In **(Fig. 1),** there are three coils that are one hundred and twenty(120) degrees apart from each other on a horizontal plane. These are Copper coils of18 Grade, uniformly wounded on a plastic forma. The coils need to be fixed on the horizontal board inorder to avoid vibrations and disturbance.In order to enhance the magnetic strength of the electromagnets, the centre is filled with metal rods of high magnetic field enhancing properties.All the cores of three plastic phama are filled with these rods, the plastic isolates the winding from rods. A cerntral disc, is surrounded by these coils, which is made up of an acrylaic sheet. This central disc has fixed gaps for permanent magnets that are uniformly distributed around it. 12 magnets are fixed in these six gaps, two magnets fixed in each gap. When the permanent magnets around a disc are moved In front of the coil, current in induced in the coil, that goes into the base of the transistor shortcircuiting it, thus primary battery comes into play and electromagnatizes the coils. Due to the formation of similar poles, the disc of permanent magnet moves. Moving the permanent magnet away, the primary source is out and the dipole formed, has been collapsed. This collapse of the dipole gives birth to a high voltage spike, which is used for charging the secondary batteries.

2.2 Related Work

Bedini in his report reveals that with a quality effort using Bedini model a battery can be fully charged using free rotating rotor for a complete discharge cycle of the primary battery (Bedini and Bearden 2006).

Effective switching using high speed power electronic switches, and switch selection is discussed. The number of switches in series are parallel are determined by the current handling and voltage withstanding capabilities of a switch (Streetman1999).

The atmosphere is full of gases that can be trapped. The SSG model was made simpler and was based on charging via a free running motor. The charging is un-conventional and is advantageous over conventional charging system. Charge and Discharge criteria is emphasized over a specified voltage spike (Bedini 2006). The author has narrated the history of scientists who strived for the concept of free energy. It is discussed how it would affect the centralized power system and would have a deep impact on the life of a common man in under developed areas (Bearden 2002).

Calculations for radiant energy in free electrons were made. Equations were obtained using Hamilton Formalism. It was concluded that gain coefficient and energy change was strictly dependent on beam and device parameters. (Oganesyan 2017).

Radiant Energy Conversion system was proposed which shielded its content from different environmental effects (Lu. 2010). The energy was concentrated to orthogonal axes using the microcontroller to maximize its effect. Recommendation were made about the system of radiant energy generation. A method was devised for creating back EMF which was ultimately used to charge various batteries. Available radiant energy was helped to create back emf which helped in storage charge in batteries (Bedini2006).

2.3 Proposed Model

As shown in **(Fig. 2),** when the magnet approaches the coil, it induces a current in the trigger coil that goes through 1N4401 diode, the resistor and potentiometer. When the magnet is directly above the core, the induced current stops. Then when the magnet has passed the core it induces the current in the opposite direction that flows through the base of the transistor and out through the emitter. This turns on the transistor and the current are then free to flow from the positive of the primary battery through the primary coil, and back to the negative of the battery. MOSFETS are used as switches because of their high switching, voltage withstanding capabilities. Other switches caused switch failures due to overheating as a result of high voltage spikes. Once the magnet has passed the coil, the magnet no longer induces a current in the trigger coil and so the transistor turns off. The coil's magnetic field then collapses which creates a high potential spike in the primary coil that goes through the charging battery.

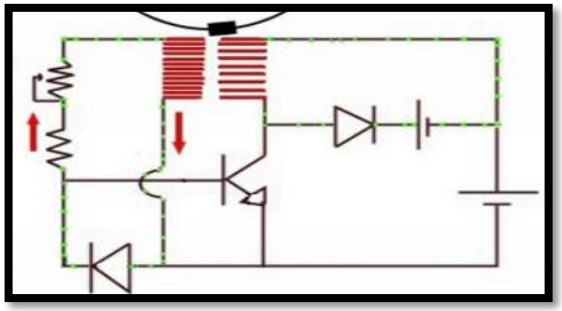

Fig. 2: Elementary Design Circuit

The radiant battery charger is basically designed on the basis of SSG (simplified school girl) circuit; the main purpose of this device is to provide better conversion efficiency for charging batteries. The RBC (radiant battery charger) achieves this goal by employing multiple power windings (slave coils) with a single trigger winding (master coil) for synchronization of the switching of the transistors.

The trigger winding is one of the most important parts of RBC. It provides the synchronization signals to each transistor which puts the primary battery into the circuit to sustain the servo motion of the rotor. The trigger coil takes the current induced in the coil to the base leg of each transistor through the trigger bus. There

is only one trigger winding in the system wound on the master coil together with 3 power windings. The trigger winding has a length of 200ft, wound on the master coil independently (trigger wire core). The length of the trigger winding is large because the value of the induced Force which is required to turn on the transistors is governed by the relation:

$$F = nBILsin\emptyset$$

Where *"n"* is the no of turns,
And *"L"* is the length of the solenoid.
The trigger winding is *AWG # 21*.

The power windings use the current from the primary battery to sustain the motion of the rotor. When during the running cycle the magnets are attracted back towards the core the transistors are turned on by the trigger winding which allows the current from the primary battery to flow through the power windings, the direction of this current is such that the electromagnet (the coils with the iron core act as a electromagnets) pushes the north faces of the magnets away from the core and the rotor motion is sustained. There are 4 power windings per coil of length 400ft each. The power windings are AWG # 18.

Six pairs of double stacked ceramic grade 5(7/8 inches X 2 inches X 3/8 inches) magnets were attached to the rotor with the north poles facing the coil cores. The magnets were attached to the rotor using epoxy glue and nylon re-enforced tape. A plexi-glass rotor of 7 inches diameter and 12mm thickness was used with equidistant magnet slots on the periphery. The rotor was attached to a fixed shaft with a 16mm ball bearing.

Magnet is at the top of the *Master coil*, thus there is an induced current in the *Trigger-winding* that makes its way across the resistor to complete the loop. As soon as the magnet is at the center ,that is on the top of the core there is no induced current in any of the power or trigger windings and the circuit is in off state .As it reaches the top of the trigger winding, it induces a current in the opposite direction to the one induced before, here the diode *IN4007* comes into action directing the current to Base Leg of the transistor, which switches on the transistor and results in the completion of the circuitry connected to the primary battery. The current from the primary battery flows through the power windings producing a magnetic field which has its North Pole facing out towards the magnet causing a push effect on the magnet (which also has its North Pole facing the core of the coil). This causes the magnet to move further away from the coils causing a collapse in the magnetic field inside the coils, this collapsing magnetic field contains the Radiant event explained in Chapter 2. The radiant event results in the generation of a current less voltage spike (Radiant Spike) which is directed towards the charging battery through the 1N5408 diode. The whole process is an iterative process that repeats its self on arrival of the next magnet at the Master Coil.

The Radiant Spike removes *sulfation* (prime cause of early battery failure. Main cause of sulfation is sulfur crystals which are formed due to sulfur in the sulfuric acid. These sulfur crystals are attached to the lead plates and act as insulation, keeping the battery from accepting charges) from the battery, charging it. Since all the magnets attached to the rotor are equidistant from each other and the Master and Slave coils are also at 120 degrees with respect to each other thus at any given time all three magnets (facing the coils) are at the same relative position with respect to the coils this results in the application of equal push at three points on the rotor. Since the rotor is circular this three-point push translates into clockwise or anticlockwise force (depending on the initial manual push on the rotor) acting on the rotor which accelerates the rotor this is why the rpm keep on increasing until the maximum rpm is attained.

Heat sinks were made part of the physical model so as to dissipate excessive heat produced due to high voltage spikes in power electronic switches.

3. RESULTS AND DISCUSSION

(Table1) shows the charging voltage of battery against time whereas **(Table2)** shows the discharging voltage of the battery against time (Radiant Battery Energizer).

Table 1: Battery Charging Data

Time (min)	Voltage (Volts)	Time (min)	Voltage(Volts)
10	10.8	130	11.69
20	10.92	140	11.77
30	11	150	11.85
40	11.07	160	11.91
50	11.14	170	11.96
60	11.21	180	12.02
70	11.27	190	12.11
80	11.29	200	12.18
90	11.4	210	12.2
100	11.5	220	12.2
110	11.59	230	12.2
120	11.63	240	12.2

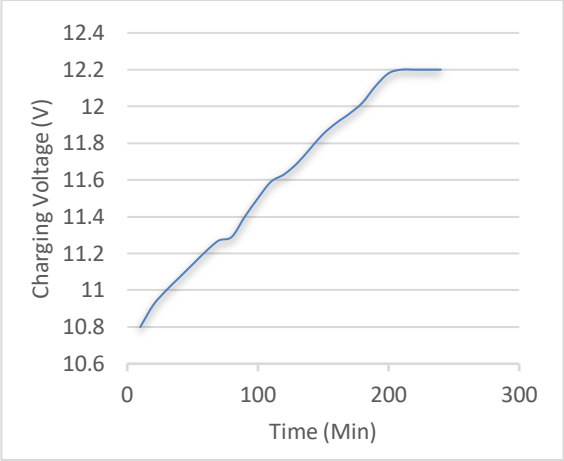

Fig. 3: Battery Charging Characteristic

In **(Fig. 3),** charging voltage has been plotted against time whereas in **(Fig. 4),** discharging voltage is plotted against time. This clearly shows that both charging and discharging is stabilized and controlled. The charge discharge characteristic show that charging is slower compared to discharging. In addition to this the system is able to charge multiple batteries at a time which shows the effective of radiant batter energizers. About four batteries could be charged simultaneously by discharging a single battery for magnetizing the Main coils. The system works as efficient battery charging system and provides storage in terms of multiple batteries connected in parallel.

Table 2: Battery Discharge Data

Time (min)	Voltage (Volts)	Time (min)	Voltage(Volts)
10	12.2	130	11.87
20	12.2	140	11.86
30	12.2	150	11.83
40	12.19	160	11.82
50	12.17	170	11.80
60	12.12	180	11.77
70	12.08	190	11.77
80	12.01	200	11.75
90	11.97	210	11.74
100	11.95	220	11.72
110	11.91	230	11.71
120	11.89	240	11.70

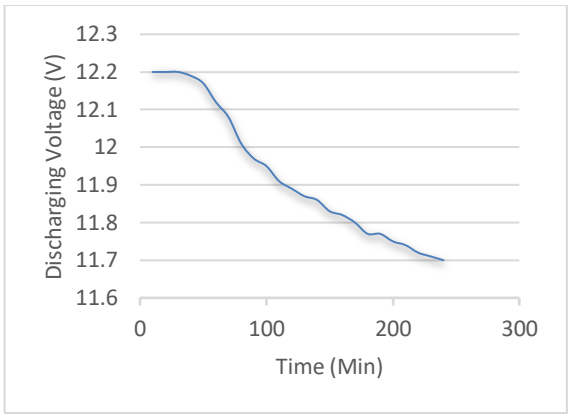

Fig.4: Battery Discharging Characteristics

The uniform discharging of parallel batteries is only possible if load is managed and distributed equally among the batteries. This is possible with the help of microcontroller and load management techniques.

4. CONCLUSION

Once we are able to charge and discharge batteries using radiant battery energizer without consuming any power. Then we would be able to either add invertor circuitry to the batteries as in case of UPS and then get AC appliances connected or we can connect a DC load directly to the charged batteries.

Future work includes heat sink provisions to power electronic switches in order to decrease their rate of failure. Number of batteries could be increased in parallel configuration and microcontroller based intelligent load sharing should be introduced to limit the discharge rates.

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