

# A Potential Energy Regenerating System Fueled by the Gravitation

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**Abstract**—A system of transferring the intangible gravitation to liquid's potential energy was disclosed recently. This system has shown that the intangible gravitation is not just a kind of force; it is also a kind of renewable energy that is harnessable. The theoretical foundation of this system is Pascal's principle; an important physical principle that has existed for more than three hundred years long. From theoretical aspect, this system can generate energy as much as a large multiple of the input energy. Yet, from practical aspect, this system needs energy to support its initial setup and followed running. In other words, it can't use the generated potential energy to self-supply the required energy. Therefore, from economical aspect, it is not clear if the energy generated is still profitable if the cost of the required energy is taken into consideration. In this paper, a potential energy regenerating system which not only can generate the liquid's potential energy but also can use the generated potential energy to self-supply the required energy while running will be introduced. This new system is fueled solely by the gravitation and can repeatedly perform the processes of the potential energy's generating.

**Keywords**- Gravitation energy; Renewable energy; Pascal's principle; Energy regenerating system

## I. INTRODUCTION

The universal gravitation is a kind of force existed in the universe. On the surface of a planet, it owns all nice features that an ideal renewable energy should have: big force, stable, existed everywhere and existed at any time. Since no one had known how to harness this intangible energy, therefore, the "gravitation" had never been formally regarded as a kind of renewable energy until Nov. 2010.

Recently, a system of transferring the gravitation force to incompressible liquid's potential energy was disclosed [1]. This system has shown that the intangible gravitation is in fact a kind of renewable energy that can be harnessed. From now on we shall call the system given in [1] as VTPEG (Vertical-Type Potential Energy Generator).

The theoretical foundation of VTPEG is Pascal's principle (or Pascal's law), an important physical principle that has existed for more than three hundred years long (Blaise Pascal, 1623~1662). VTPEG uses the incompressible liquid as energy carrier and have it to carry out the energy.

The main reason that gravitation hadn't been regarded as a kind of energy for such a long time is that it owns a killer feature, namely, the feature of "intangibility". Intangibility is a kind of feature that one can neither see it nor touch it; and most people don't even feel its existence.

In an example given in [1], it shows that VTPEG can create potential energy as much as a multiple of 94 times of the input energy in a single round of operation. This result is amazing comparing to the transferring efficiency of other known renewable energies such as solar or wind energies.

Despite that VTPEG can generate a large multiple of the input energy for each round of operation; it carries a shortcoming. It needs energy to setup and operate the system. VTPEG doesn't have the capability of self-supplying the required energy.

The energy generated by VTPEG is so called the "raw energy", which can't be used to directly self-support the energy required. In other words, VTPEG needs outside power to work with. Therefore, despite that VTPEG can generate large volume of potential energy at any time and any place, the need of the outside's energy becomes a fatal limitation for its applications.

To see this, suppose that the outside energy needed is in the form of electricity; then providing electricity to VTPEG could be very costly. For example, if the VTPEG is placed at a place that is far away from the power networks, then it might need to take a very long distance of power transportation to get the required electricity. An alternative way might be using a movable electricity generator to generate the required electricity. In this case, it might also be cost a lot to keep this electricity generating system running. In short, it is not clear if the energy generated is still profitable if we take into consideration the total cost of the outside energy required.

This paper will focus on the shortcoming of VTPEG. A potential energy regenerating system that can generate liquid's potential energy without using outside energy will be disclosed. To be more specifically, it is a mechanical system that once it is started, it will use the gravitation to generate

liquid's potential energy and then use the generated energy to self-supply the required energy for the repeated running.

The remainder of this paper is organized as follows. In section 2, Pascal's principle will be discussed and a brief review of the VTPEG will be given. In section 3, an inclined-type potential energy generator will be introduced. In section 4, a seesaw-type potential energy regenerating system will be disclosed. In section 5, conclusions will be given.

## II. PASCAL'S PRINCIPLE AND THE POTENTIAL ENERGY GENERATOR

### A. Pascal's Principle

Pascal's principle given in Wikipedia is stated as follows [2].

*In the physical sciences, Pascal's law or the Principle of transmission of fluid-pressure states that "pressure exerted anywhere in a confined incompressible fluid is transmitted equally in all directions throughout the fluid such that the pressure ratio (initial difference) remains same."*

The most well-known application of Pascal's principle is the hydraulic lift. Figure 1 is a conventional hydraulic lift, wherein the areas of the small and the big piston are  $A_1$  and  $A_2$  respectively. We used to exert a small amount of push down force on the small piston and then get a large amount of lift up force on the big piston.

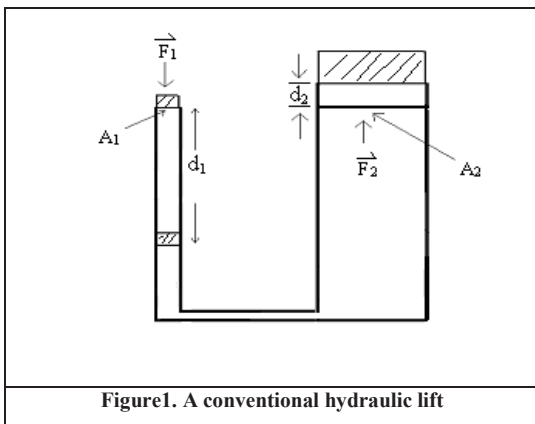


Figure1. A conventional hydraulic lift

In figure 1, a push down force  $F_1$  is exerted on the small piston and a lift up force  $F_2$  is thus derived on the big piston. Here, Pascal's principle can be characterized by following two equations:

$$F_1 / A_1 = F_2 / A_2 \dots\dots(1)$$

$$A_1 d_1 = A_2 d_2 \dots\dots(2)$$

From (1) (2), we can derive:

$$F_2 = (A_2 / A_1) F_1 \dots\dots(3)$$

$$d_2 = (A_1 / A_2) d_1 \dots\dots(4)$$

Equation (3) is used as the theoretical foundation for the hydraulic lifts. Now, let's focus on the equation (4). At the first glance, equation (4) seems nothing special at all.

Nevertheless, equation (4) hides a big secret. To our great surprise, equation (4) is the theoretical foundation for the potential energy generating. To be more specifically, let's consider a nonconventional hydraulic lift, a hydraulic lift that uses the large piston to lift up the small piston. Figure 2 is the schematic view of such kind of hydraulic lift.

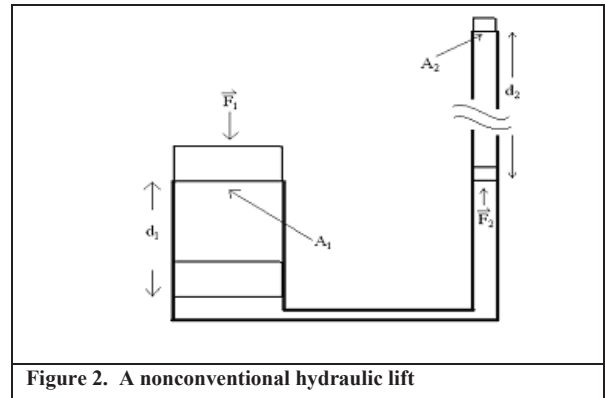


Figure 2. A nonconventional hydraulic lift

In figure 2, if we exert a push down force on the large piston and results in a  $d_1$  moving down displacement on the large piston, then it will result in a  $d_2$  moving up displacement on the little piston satisfying the equation (4). Equation (4) indicates that if the area of  $A_1$  is far bigger than the area of  $A_2$ , then it will result in a very long vertical moving up displacement.

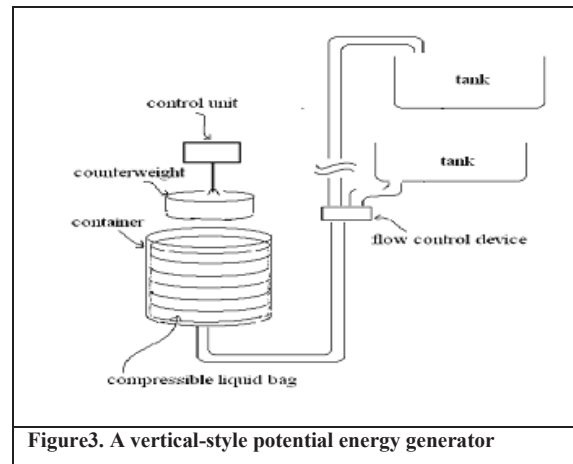


Figure3. A vertical-style potential energy generator

### B. VTPEG: Verticle-Type PotentialEnergy Generator

VTPEG is a modification of the nonconventional hydraulic lift given in [1]. It uses equation (4) as its theoretical foundation to transport the liquid from low water level to high water level. The major modification is to separate the big piston from the liquid container. To be more specifically, the component of the big piston is replaced by a counterweight and a compressible liquid bag, which has an outlet connected to the pipe that has the small piston on the other end. Besides, the small piston is removed and the pipe originally connected to the small piston is extended vertically up to a higher water

level location and then horizontally bended to one side so that the liquid can be transported to a water tank at higher location. VTPEG also has a flow control device to control the liquid's flowing directions. In addition, a control unit is used to control the movement of the counterweight. Figure 3 is the schematic view of VTPEG [1].

### III. ITPEG : AN INCLINE-TYPE POTENTIAL ENERGY GENERATOR

In the foregoing section, we have given a brief review of Pascal's principle and the VTPEG. Using VTPEG, we can artificially generate liquid's potential energy. Now, let's modify this VTPEG to become so-called the *Inclined-Type Potential Energy Generator* (ITPEG). The only difference between ITPEG and VTPEG is that the compressible bag of ITPEG is placed inclined on a sliding plate rather than placed vertical to the earth surface. In this case, the counterweight is no longer pushing the compressible bag in the way of free falling. Instead, the counterweight will exert the pushing force to the compressible bag through sliding or rolling.

The ITPEG is the key component of a mechanical-style potential energy regenerating system that will be introduced in the next section. Figure 4 is the schematic view of an ITPEG.

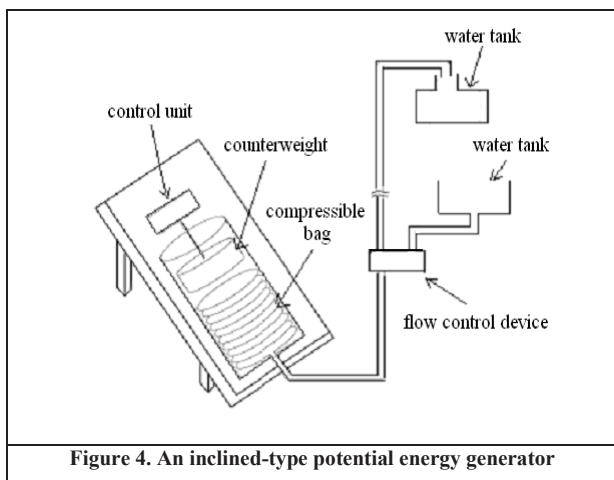


Figure 4. An inclined-type potential energy generator

### IV. STPERS: SEESAW-TYPE POTENTIAL ENERGY REGENERATING SYSTEM

Two major problems of designing a potential energy regenerating system are: (1) how to generate the potential energy; and (2) how to use the generated potential energy to self-support the system's repeated running. In order to use the generated potential energy to self-support the system's repeated running, one can take the advantage of using two ITPEGs as base components and put them symmetrically so that they form a seesaw-type structure. Furthermore, we have the fluid pushed by the ITPEGs to alternatively flow back to both sides of the compressible bags. Using this method, the torques of both sides of the seesaw will be changed. It thus will let the seesaw structure alternatively move up and down

in the way of repeatedly. Figure 5 is the schematic view of the STPERS.

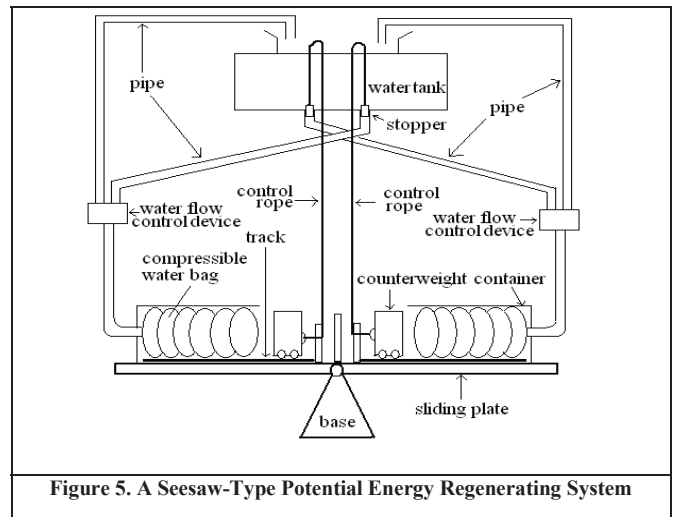


Figure 5. A Seesaw-Type Potential Energy Regenerating System

Now, let's take a closer look at this system.

- Two identical ITPEG's are placed symmetrically to form a seesaw-type structure so that the two counterweights are near the center and the outlets of the compressible liquid bags are located at seesaw's two ends.
- There are tracks on the plate of the seesaw. Besides, each counterweight has wheels that can roll on tracks to give or release the pushing force to the compressible bag.
- A water tank is located at a higher place and is used to store water that flows from the compressible bags. At the bottom of the water tank, there are two outlets; each outlet is controlled by a stopper associated with one side of the compressible bag and connected to a water flow control unit thru a pipe.
- Between the center of the seesaw and the counterweight, a separator is used to confine each counterweight to stay on one side of the seesaw.
- Each counterweight has a suitable length of control rope connected to it on one side and has the other side connected to the stopper. The control rope connected to the counterweight of the left hand side of the seesaw controls the outlet of water that flows to the input of the right compressible water bag. While the control rope connected to the counterweight of the right hand side of the seesaw controls the outlet of water that flows to the input of the left compressible water bag.

The procedure of initializing this STPERS is given as follows.

1. Have the system in the state of containing no water.
2. Using outside force to have the seesaw stay in the state of horizontal position. Furthermore, both counterweights are moved as close to the center as possible; and have both stoppers in the tank close the outlets.
3. Inject appropriate amount of water to the water tank from outside.

4. Remove all outside force from the system, and have the seesaw in the state of unbalance. Therefore, seesaw will move down to one side, and this will cause a control rope to lift up its stopper. One outlet is thus opened and the water starts flowing to the compressible bag which is in the state of being lifted up.
5. STPERS starts moving repeatedly.

Once this machine is initialized it will move as follows.

1. Let's assume the left-hand side of the seesaw moves down first. Then, the left counterweight will roll down along the track. It then will push the compressible bag and have the water (in the first round, this bag contains no water) be pushed up to the water tank in the above. When the counterweight start pushing the compressible bag, it also pulls the control rope connected to it. The length of the control rope is appropriately chosen so that when the counterweight stops sliding down, the stopper that control the outlet connected to the right-hand side of water bag will be lifted up. Then, the water stored in the water tank will flow to the right-hand side of compressible water bag.
2. The water keeps on flowing to the compressible water bag on the right-hand side until the torque of the right-hand side of the seesaw is bigger than the torque of the left-hand side. Then, the right-hand side seesaw start moving down and the left-hand side seesaw start moving up.
3. When the right side seesaw moves down, the right side counterweight will roll down and start pushing the compressible bag and have the water flow to the water tank.
4. When counterweight rolls down along the track, the control rope connected to it will be pulled down. Similarly to the left-hand side structure, the length of the control rope is appropriately chosen so that when it stops rolling down, the connected stopper will be lifted up. In other words, when it stops rolling, the stopper controlling the outlet to the left water bag will be opened.
5. The water then starts flowing to the left water bag. The same procedures as happened to the right water bag will be repeated on this side. This machine takes turn to flow water to compressible bags and then be pushed back to the water tank.
6. The seesaw structure of this STPERS will take turn to move up and down.

## V. CONCLUSIONS

The discovery of VTPEG is very important. It has shown

that the intangible gravitation is a kind of renewable energy that had never been thought of before. The implication of the VTPEG is that on the surface of the planet, we are now able to create the renewable energy that was used to be thought of as a gift of the Nature. Despite this great result, VTPEG carries a drawback: it needs outside energy to support its running. This drawback will largely limit its possible applications.

This paper focuses on this drawback of VTPEG. To solve this problem, we first introduce the ITPEG (Inclined-Typed Potential Energy Generator), which is a modified version of the VTPEG. Similar to VTPEG, ITPEG can generate the potential energy and can't self-supply the required energy while running. Despite that ITPEG still carries the shortcoming of the VTPEG; it is the key component of the system that can solve the problem mentioned.

Symmetrically put two identical ITPEGs together to form a STPERS will solve the drawback mentioned. The functions that a STPERS can perform are very limited. It can transfer the gravitation to liquid's potential energy and keeps its seesaw moving up and down. It seems that this system can do nothing useful. Nevertheless, STPERS discloses a very important architecture and operating mechanism. It reveals techniques of a potential energy generator that can self-supply the required energy using self generated potential energy directly and without going through the process of generating the electricity. In other words, it identifies a *potential energy regenerating system* that fueled purely by the gravitation.

Despite the simplicity of STPERS, the applications of STPERS are surprising. It is very easy to modify the STPERS to become an electricity generating system. In other words, it is now feasible that we can generate the electricity purely by the gravitation energy. With the limit space of this paper, the detailed techniques will not be discussed here.

## ACKNOWLEDGMENT

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