

Pendulum operated Water pump

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1. INTRODUCTION

There has been an increase in the demand for energy in recent years, which has led to the development of various advanced resources that produce a certain percentage of the energy needed. It is the household itself that consumes a considerable amount of energy. It is estimated that a substantial amount of electricity is wasted in the pumping of water, irrigation purposes, etc. Thus, the importance of pendulum pumps becomes apparent, whereby a large amount of energy can be conserved, and the conserved energy can be used for a variety of purposes.

Most villages and some town side areas have piston pumps installed to draw water from the ground. Ground water is a source of water from the ground that comes from sucking water from the ground. Those who access the pump need to provide reciprocating motion. Water comes out of the ground by using a reciprocating motion to create suction. This method has a low maintenance requirement, and is easily accessible, so it cannot be easily replaced. As a result, it has been at its peak for quite some time. However, we have no idea how to replace those pumps. We have an idea on how to reduce the amount of human effort required for these kinds of pumps.

The reciprocating motion in the piston pump can be replaced by an oscillating motion obtained by oscillating a certain mass. Hand-pump with a pendulum - a new and technically original idea - provides work relief, since it only requires occasional movements of a pendulum with a finger instead of large swings.

It can be used for irrigation of smaller lots, for water wells, and for extinguishing fires by old and young people alike, using a minimum of human strength in comparison with present classical hand water pumps. Water pump with pendulum is the realization of a new,

original and even unbelievable method of pumping water. Work is alleviated because the hand pump is easier, longer lasting and effortless to use. For the pump to start pumping, a pendulum needs to be out of balance to push the water out. Following that, the piston begins to oscillate as a result of gravitational potential, and the output pipe is now emitting a steady stream of water. To keep the amplitude constant, the pendulum needs to be pushed every so often. The pump performs effectively with pendulums of all sizes, but particularly those with an amplitude of 90°.

2. AIM

To reduce use of electricity in a certain amount and human efforts by using kinetic & potential energy created by pendulum.

3. OBJECTIVES

1. To lower the amount of electricity used in small businesses where water is pumped in for cooling while cutting metals, etc.
2. To lessen the farmer's work in providing fertilizers.
3. To lessen the farmer's effort in providing water for drip irrigation.
4. To make it easier to provide water for gardening.
5. To reduce the use of electricity

4. LITERATURE REVIEW

- 4.1 : The significance of a pendulum pump, which may be used as an additional tool for pumping water and is designed to take the place of hand pumps, was covered by Rony K. Placid in research article "FABRICATION AND ANALYSIS OF A PENDULUM PUMP."
 - i. When compared to a regular manual water pump,

a pump with a pendulum has the advantage of alleviating or, to put it simply, making work easier.

- ii. It is because of the above-mentioned property that the pendulum pump is an effective method for the watering of smaller lots, water wells, and may be used to put out fires even by elderly and young people.
- iii. By using a pendulum-based water pumping system, we can improve plant productivity while lowering labour costs, manufacturing time, and personnel needs.

4.2 The research paper "DESIGN AND FABRICATION OF HAND WATER PUMP WITH PENDULUM" by Akshaj Adhikari described the effect of generating free energy in a device made of an oscillating pendulum lever system and a system for starting and sustaining the pendulum's oscillation. System that dampens the oscillations of the lever to use the device's energy. Since the pendulum's axis exerts a force that changes periodically on one of the two arms of the two-armed lever, the machine's operation relies on the forced oscillation of the pendulum. A portion of the pendulum-lever system's overall oscillation energy is converted into work for driving a pump, a press, and a rotor in an electric power system. Numerous physical models demonstrated how free energy is produced.

4.3 In this study, the difference between the energy that a machine sends to a user system via a lever and the energy that a user system must draw from the environment in order to keep the pendulum oscillating is referred to as the effect of creating free energy. The law requiring energy conservation is broken by the appearance of free energy. The difference between the work of the orbital damping forces of the lever and the work of the radial damping forces of the pendulum motion has the effect of generating free energy. Increase in input energy is made possible by this impact.

5. PRINCIPLE COMPONENTS :

5.1 : Frame:

The frame is the main part of the pump system and it is made of steel, the frame has seven rigid links that translate pendulum movement into piston movement.

5.2 : Reciprocating Pump:

The pump is a positive displacement pump. It is fitted closely with the cylinder by a plunger or by actual displacement.

5.3 : Spring:

As springs are elastic objects that store mechanical energy, both tension springs and compression springs are used in this system. Both tension springs and compression springs stretch and compress with a load.

5.4 : Oscillating Pendulum :

An object suspended from a pivot such that it can swing freely is called a pendulum. In our scenario, the lever's primary input is what further produces the desired result. Pendulum is made up of two pieces. Two bolts that have been joined together form our rod, and we used weights as the bob. Using a bracket housing with a pedestal bearing installed, it is attached to the lever.

5.5: Lever:

The lever moves like a seesaw after being moved by the pendulum. Due to the spring and piston rod's connection to the lever's other side, the oscillating motion of the piston in the cylinder is converted to a reciprocating motion.

5.6: Pendulum Bracket:

The pendulum bracket's principal job is to hold the pendulum lever and counterweight in place. A bearing is installed in a pendulum bracket to support the bracket shaft as it oscillates as a result of the pendulum.

5.7: Bearings:

Two pedestals bearing one on either side of the lever, which serves as the lever's fulcrum, support the rod. With the aid of bearing, the assembly of the lever mounted on bearing rotates. For the motion of a pendulum, another pedestal bearing is used at the pendulum bracket.

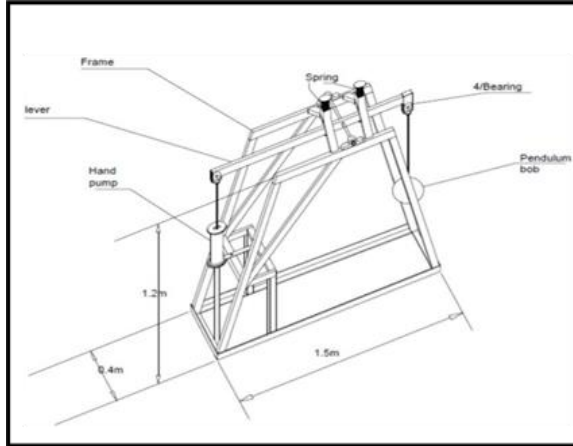


Fig : Systematic Diagram of Pendulum operated Hydraulic water pump.

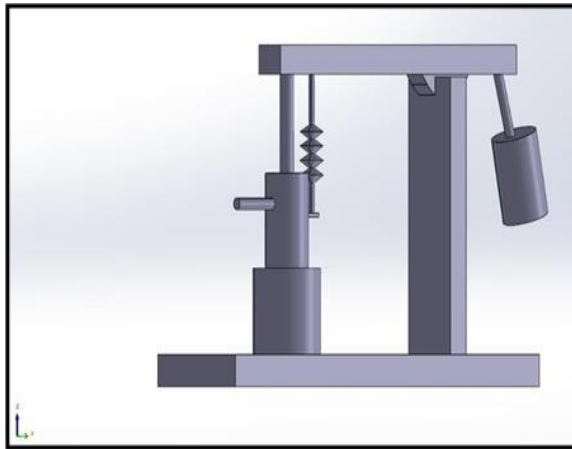


Fig : Software diagram of Pendulum operated Hydraulic water pump.

REFERENCE

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6.WORKING PRINCIPLE

The pump is made of pendulum, two-leg lever and cylinder with the piston which pumps the water. Periodic movement of the human arm keeps the pendulum oscillating. The pendulum's oscillation period is twice as long as the lever's oscillation period. The pump's piston has a reverse effect on the lever and reduces oscillation.

The pendulum is dampened by the motion of the lever, but the work of the force dampening the pendulum is less than that of the forces dampening the motion of the lever. The pendulum is in its vertical equilibrium position, while the lever is at its horizontal equilibrium position. The lever and pendulum oscillate in the same plane, which is vertical with respect to the ground.