

# What are the us gravity energy storage patents

They can be summarized into two aspects: principle and equipment. As for the principle, although each technological route lifts heavy objects in different ways (e.g., using ropes, carriers, or water currents), they all do so by lifting heavy objects to store electrical energy. This is the reason why they are all called solid gravity energy storage.

An energy storage system and method that enables gravity-based energy storage to have a significantly larger capacity in a single shaft for given capital cost and thus an improved cost per unit energy for large scale energy storage as well as enabling continuity of power input and output at an external connection point across the extent of the system's energy capacity comprises a ...

Solid gravity energy storage technology has as many as eight technical routes. Although the technical routes are different, some essential features are the same. They can be summarized into two aspects: principle and equipment.

It also revealed that the concrete foundations have been completed for the firm's first gravity storage project in the US, in Georgia with Enel Green Power. Energy Vault now provides a range of energy storage solutions including battery storage and green hydrogen and is forecasting for US\$325-425 million in revenues this year.

Energy Vault Inc received a granted US patent US 10,683,851 B2 for their energy storage system that stores and releases energy via the stacking of blocks. In particular, the claims of the patent, which define the scope of the protection, are focussed on a grabber ...

Gravity energy storage technology (GES) depends on the vertical movement of a heavy object in a gravitational field ... public patents (search by the US, European, and Chinese patent databases ...

Free Energy is a perpetual motion machine that operates indefinitely and independently without any other source of fuel, electricity, or any other renewable energy source other than gravity. Free Energy produces more energy than the amount of energy necessary to operate the machine itself. Never before has a machine of this nature been produced.

Edinburgh-based startup Gravitricity is set to turn one of Europe's deepest mines into the continent's first-ever gravity energy storage system. The gravity tech uses massive weights that are ...

Applications of Gravity Energy Storage Technology. Grid Stabilization: Gravity-based energy storage technology systems can help stabilize the grid by storing excess energy during periods of low demand and releasing it when demand peaks, thus reducing the need for costly peaker plants and enhancing grid reliability.; Renewable Integration: By providing a ...

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An energy storage system comprises a cable (13) (13) and a mass (20) suspended from the cable (13) in a shaft (12) (12). The cable (13) is attached to a winch (11) by which the mass may be raised in the shaft (12) to store potential energy, and the mass is lowerable in the shaft (12) to release the potential energy. The mass comprises at least two sections clamped together ...

The present invention provides novel designs and improved methods for the construction and operation of a gravity powered energy storage facility. This facility might also ...

A system for harvesting, storing, and generating energy includes a subsurface structure supporting machinery to convert received energy into potential energy, store that potential energy, and at a later time convert that potential energy into electrical energy. The system includes one or more buoyant chambers that support the subsurface structure and are maintained with an ...

A hydro electric energy generation structure is disclosed. The structure comprises: a gravity wall forming a closed outer perimeter extending above an upper water level of an existing hydraulic reservoir, and extending below the reservoir floor; at least one water inlet hydraulically connecting a first penstock to a first turbine generator below the water inlet.

The present invention provides novel designs and improved methods for the construction and operation of a gravity powered energy storage facility. This facility might also be called a gravity battery or a gravitational potential energy storage device. The device converts electricity into gravitational potential energy, and vice versa, by raising and lowering massive ...

Energy Vault System with pilling blocks. Gravity on rail lines; Advanced Rail Energy Storage (ARES) offers the Gravity Line, a system of weighted rail cars that are towed up a hill of at least 200 feet to act as energy storage and whose gravitational potential energy is used for power generation. Systems are composed of 5 MW tracks, with each ...

The speculative field of gravity-based energy storage got a boost recently with news of a strategic investment and new patents. Swiss-U.S. startup Energy Vault, one of the most high-profile ...

Device for storing energy, using a physical object, such as a mass or buoyant object floating in fluid. A mass is repositioned to greater altitude in a gravitational field to a position of higher potential energy. A buoyant object is forcibly submerged into a fluid, displacing fluid, to a position of higher potential energy. The stored potential energy may be recovered with extremely low ...

EP is the energy stored in the gravity piston. The compressed air part relies on the air compression and expansion for energy conversion, and its energy storage capacity can be expressed as : (11)  $E_A = i_A \cdot V_1 \cdot V_2 \cdot P \cdot d \cdot V$  where  $i_A$  is the circulation efficiency of isothermal compressed air.  $V_1$  is the volume of air before compression.

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The Gravity energy storage and generating device, main object of the invention is to provide improved mechanical energy storage and release device comprising of the wound and weight energy storing elements. The said device installed in the ground or above where gravity plays a vital role in generating and storing, a large stainless steel encased concrete piston mass that ...

Invention defines a method and apparatus for storing energy where a power source is used to reposition a mass in a gravitational field to a position of higher potential energy where the ...

The main countries and regions of patents that accepted gravity energy storage technology patents are shown in Fig. 2(a). The figure clearly illustrates, China is the most important target market for gravity energy storage technology, accounting for 60% of the total number of the global gravity energy storage technology patents.

A buoyant object is forcibly submerged into a fluid, displacing fluid, to a position of higher potential energy. The stored potential energy may be recovered with extremely low loss regardless of ...

Country: USA | Funding: \$31.3M Quidnet Energy is developing an alternative approach to energy storage by storing water to deliver energy. This new form of sub-surface pumped hydro storage enables large-scale deployment of renewable energy and allows for predictable, dispatchable delivery of power from intermittent renewable energy resources such ...

The decision tree is made for different technical route selections to facilitate engineering applications. Moreover, this paper also proposed the evaluation method of large-scale energy storage technology and conducted a comparative analysis of solid gravity energy storage with other large-scale energy storage technologies.

gravity energy storage technology (SGES)). to store or release electricity. This technology accomplishes energy storage by converting the electrical energy in the power system to the gravitational potential energy of the weight through electromechanical equipment.

The Gravity Field Energy Storage & Recovery System [GFESRS] invention is a mechanical, electrical and electronic system that has the ability to harness any electrical or mechanical power source and allow it to do work to configure a mechanical system into a state of high potential energy, using either a hi-mass object in a gravitational field ...

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