

Patented gravity energy storage

Are gravity energy storage systems the future of energy storage?

Gravity energy storage systems, using weights lifted and lowered by electric winches to store energy, have great potential to deliver valuable energy storage services to enable this transformation.

How do gravity energy storage systems work?

The Gravitricity system Gravity energy storage systems depend on the principle of lifting one or more solid masses a vertical distance in order to increase their gravitational potential energy. The system must then be reversible to allow the lowering of the weight (s) to result in useful release of the stored energy, less any efficiency losses.

What is a gravity energy storage device?

In simple terms a gravity energy storage device uses an electric lifting system to raise one or more weights a vertical distance thereby transferring electrical energy to be stored as gravitational potential energy.

What is a single weight gravitational energy storage system?

Single weight Gravitricity system The simplest design of an underground gravitational energy storage system is a single weight cycling in a straight vertical shaft from an upper to a lower position. As shown in Fig. 5.6, this single weight could be supported by a number of winches around the shaft head.

Does gravity have energy storage?

In addition to electrical energy storage, Gravitricity has also filed patents covering additional or combined uses in the shaft, including interseasonal heat storage and the use of the shaft internal volume as a pressure vessel for CAES or hydrogen storage.

How can a gravity energy storage system be scaled up?

4.1.2. Multiweight The energy storage capacity of a gravity energy storage system can be scaled up and optimized by using multiple weights.

It was seen that patent filings in gravity based energy storage systems has been, on average, increasing year-on-year. 2023 was also full of commercial developments and brought news that Gravitricity and Energy Vault are moving forward with commercialising gravity energy storage systems around the world; Gravitricity are partnering with ABB and ...

The Gravity Field Energy Storage & Recovery System 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 high-mass object in a gravitational field or a ...

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Our GraviStore underground gravity energy storage technology uses the force of gravity to offer some of the best characteristics of lithium batteries and pumped hydro storage. Hydrogen Storage Our H 2 FlexiStore underground hydrogen storage technology uses the geology of the earth to contain pressurised fuel gas, allowing safe, large-scale ...

A new energy storage system known as Gravity Energy Storage (GES) has recently been the subject of a number of investigations. It's an attractive energy storage device that might become a viable alternative to PHES in the future [25]. Most of the literature about gravity energy storage emphasises on its technological capabilities.

6 · The technology leverages the significant depths of these shafts to maximize energy storage potential, making it more space-efficient and cost-effective than constructing new facilities or using above-ground structures. This approach repurposes idle assets and contributes to the circular economy by reducing the need for new constructions and the associated ...

Patent lawyer Ben Lincoln from Potter Clarkson looks at gravity energy storage and what sort of IP is looking to be protected. Premium Eos, ESS Inc, Energy Vault: "Non-lithium", long-duration tech providers" Q3 financials

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 ...

A gravity based energy storage system with overlapping weights is also described. The system enables weights to be disposed in an existing shaft which has disadvantageous features at its lowermost region, such as abandoned machinery or water. ... 2020-05-06 Publication of GB202004271D0 publication Critical patent/GB202004271D0/en ...

Abstract: A gravitational energy storage system is provided that includes one or more tracks extending from a lower storage yard to an upper storage yard, a plurality of mass cars moveable along the track, a conveyance system comprising at least a first tether, and a first power module associated with the first tether to drive a respective one of the first tethers to ...

Patents for gravity energy storage: Who is filing them and what's being protected? 11. 01. 2024 9:31 Energy Storage, Ben Lincoln, Potter Clarkson. Patent lawyer Ben Lincoln from Potter Clarkson returns to the Energy-Storage.news Guest Blog, this time looking at gravity energy storage and what sort of IP is looking to be protected. ...

Low-carbon energy transitions taking place worldwide are primarily driven by the integration of renewable energy sources such as wind and solar power. These variable renewable energy (VRE) sources require energy storage options to match energy demand reliably at different time scales. This article suggests using a gravitational-based energy storage method ...

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A schematic diagram of the suspended weight gravity energy storage system. h is the height of the suspended weight, d is the diameter, D is the depth of the shaft, $D - h$ is the usable depth ...

Terrament Gravity Storage. Terrament is building long-duration energy storage with gravity batteries deployed deep underground. Our patented design achieves high scale and low cost by maximizing the two simple ingredients of gravity storage: height and weight. Height: We dig a mile deep into bedrock using existing drilling tech.

The invention discloses a gravity energy storage system based on multi-object efficient lifting and transferring, which comprises a vertical shaft (1), a roadway (2), an upper weight storage warehouse (3), a lower weight storage warehouse (4), a support beam frame (5), an electric hoist (6), a car (7), an AGV forklift (8) and n weight carrier modules (9); under the working condition ...

Over the last decade, ARES has developed, tested and patented rail -based, gravity- powered energy storage technologies. By 4. th. quarter 2024, we will have our first facility in operation with many more to follow. Manufactured in the United States . No Degradation. Low Cost . Lithium Free. Non-Flammable. Water Free. Rail-Based Gravity Storage. 3

Gravity energy storage systems, using weights lifted and lowered by electric winches to store energy, have great potential to deliver valuable energy storage services to enable this transformation. ... Gravitricity have developed a patented concept that achieves continuous supply with multiple weights by using two independent "teams" of ...

Existing mature energy storage technologies with large-scale applications primarily include pumped storage [10], electrochemical energy storage [11], and Compressed air energy storage (CAES) [12].The principle of pumped storage involves using electrical energy to drive a pump, transporting water from a lower reservoir to an upper reservoir, and converting it ...

The invention provides a gravity energy storage system based on a vertical shaft and a roadway, which comprises a vertical shaft (1), the roadway (2), an upper track (3), a lower track (4), a supporting beam frame (5), a motor generator (6), a winch (7), a car (8) and n weight carriers (9); under the working condition of energy storage, a heavy object carrier (9- n) moves to the inside ...

2016-03-17 Publication of WO2016040746A1 publication Critical patent/WO2016040746A1/en Links. Espacenet; ... the motion of tether 158 ensuring its proper spooling onto drum 164 and effectively lowering the overall center of gravity of the energy storage module 167 to help resist the forces imposed on floating wind turbine 160 by the wind.

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

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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 ...

Gravitational energy storage built is a cylindrical reinforced concrete structure including a cylindrical outer core and a centrally placed cylindrical inner core, vertical with stiffening ribs and resting shelves, in pairs facing the adjacent rib, and on each pair of shelves made of external and internal trusses rests a ballast beam, and above each section of ballast beams, there is a main ...

Energy Vault, Gravity Power, and their competitors seek to use the same basic principle--lifting a mass and letting it drop--while making an energy-storage facility that can fit almost anywhere.

2019-10-03 Priority to US16/592,741 priority Critical patent/US10935005B2/en 2020-04-09 Publication of US20200109703A1 publication Critical patent/US20200109703A1/en ... Gravity energy storage power generation system and working method Citations (8) * Cited by examiner, + Cited by third party; Publication number Priority date

Gravity-based energy storage is a method of harnessing potential energy to "store" energy that can be created and deployed on demand. Our system uses the deep holes left by existing idle oil wells as the energy "storage unit," relying on our gravity well system to produce energy on-demand and push it to the power grid when needed.

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 ...

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.

has developed and patented a breakthrough gravitational energy storage system that is based upon tried and true, state-of-the-art railroad technology. ARES systems: Produce no emissions and require no fossil fuels. Requires no dams, and no water like Pumped Storage Hydro. Produce no hazardous emissions.

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 ...

Solid gravity energy storage technology (SGES) is a promising mechanical energy storage technology suitable for large-scale applications. ... the US Patent Database, and the Chinese Patent ...



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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 ...

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