Patent application for gravity energy storage power generation system

High level schematic diagrams for weight-based gravitational energy storage system designs proposed by (a) Gravity Power, (b) Gravitricity, (c) Energy Vault, (d) SinkFloatSolutions, (e) Advanced ...

Energy storage improves power system planning, operation and frequency regulation. It facilitates to maintain the energy system stability, improve power quality in micro-grid systems as well as match demand with supply [3]. Therefore, there is a need for efficient engineering processes to recover the stored energy and convert into useful work.

Gravity energy storage systems have inherent advantages in that they typically have a long operating life with a minimal maintenance burden. They are also relatively simple and do not require hazardous or scarce materials. ...

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 ...

The energy storage system can, for example, store electricity generated from solar power as potential energy in the stacked blocks during daytime hours when solar power is ...

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 ...

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Energy Storage (MES), Chemical Energy Storage (CES), Electroche mical Energy Storage (EcES), Elec trical Energy Storage (EES), and Hybrid Energy Storage (HES) systems. Each

This patent application describes a Gravity based Electrical Power Generation System. This system can be used to provide electrical power to homes or other applications as an alternative...

[0002] Gravity-based energy storage systems are increasingly being recognised as one method of energy storage and grid balancing that is reliable, can operate over a very ...

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The power liquid conveying device has the beneficial effects that firstly, continuous water supply is achieved and energy consumption is low by means of the power liquid conveying device; secondly, by means of the power generation system composed of the power liquid conveying device, a storage box and a liquid-energy power generator, the ...

A power generation system that relies on gravity. The system provides uninterrupted electrical power without dependency on the grid making electrical power generation autonomous if needed or working along with other power systems such as the grid to provide primary or backup power as required by the user.

-24 Priority to US16/140,520 priority patent/US10677227B2/en 2018-11-27 Application granted granted Critical ... 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 ...

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...

Gravity Power has built a strong leadership team and advisory board, including globally recognized experts in energy markets, regulatory policies, control theory, system analysis, generation scheduling and control, power grid control, ...

This higher energy storage capacity system is well suited to multihour applications, for example, the 20.5 MWh with a 5.1 MW power capacity is used in order to deliver a 4 h peak shaving energy storage application. This same device would also be able to provide a longer duration output at lower power or be used flexibly to provide short ...

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 ...

Step 1: Energy Generation. The first step in the operation of a gravity battery system is the generation of excess energy from renewable sources such as solar or wind power. This excess energy is used to lift the heavy mass to a certain height, where it is stored as potential energy.

US20110108362A1 US12/590,770 US59077009A US2011108362A1 US 20110108362 A1 US20110108362 A1 US 20110108362A1 US 59077009 A US59077009 A US 59077009A US 2011108362 A1 US2011108362 A1 US 2011108362A1 Authority US United States Prior art keywords lever energy free energy water machine Prior art date 2009-11-12 Legal status (The ...

Gravitricity has developed GraviStore, a gravity energy storage system that raises and lowers heavy weights in

underground shafts. Future GraviStores will store more than 20MWh, providing long-duration storage and ...

Gravity powered electrical energy generators, particularly for producing lighting is disclosed. The apparatus has a support frame (1, 30) in which a series of gears and a gear-driven generator (20) are mounted. The power to drive the most upstream gear (2) is provided by a weight suspended from a point to one side of the axis of rotation of gear (2).

Definitions. the present invention pertains to energy storage systems, particularly those in which the system is powered by gravity which uses motor/generators, or pump/turbines, or some other type of device to lift and lower modular units of mass between a higher elevation and a lower elevation in order to store electrical power in the form of potential energy, as the ...

Current power systems are still highly reliant on dispatchable fossil fuels to meet variable electrical demand. As fossil fuel generation is progressively replaced with intermittent and less predictable renewable energy generation to decarbonize the power system, Electrical energy storage (EES) technologies are increasingly required to address the supply-demand balance ...

The invention provides an environment-friendly gravity power generation system of a train. The environment-friendly gravity power generation system comprises a train accessory wheel, an elastic pedal, a bearing, a reset spring, a transmission connecting rod, a moving rod, a power generation device, a collecting system and an electric energy storage device.

The invention discloses a system and a method for combining new energy power generation with battery and gravity energy storage. Different switch connection and disconnection combinations are utilized, so that different operation modes of the system can be realized. Overall, the new energy can be directly charged to the gravity energy storage system to reduce power ...

Based on the type of blocks, GES technology can be divided into GES technology using a single giant block (Giant monolithic GES, G-GES) and GES technology using several standardized blocks (Modular-gravity energy storage, M-GES), as shown in Fig. 2.The use of modular weights for gravity energy storage power plants has great advantages over ...

CAES, a long-duration energy storage technology, is a key technology that can eliminate the intermittence and fluctuation in renewable energy systems used for generating electric power, which is expected to accelerate renewable energy penetration [7], [11], [12], [13], [14].The concept of CAES is derived from the gas-turbine cycle, in which the compressor ...

a kinetic energy conversion device, coupled to said system and configured for converting energy generated by said system to stored potential energy, wherein the storage ...

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The invention discloses a gravity energy storage system for high-power relay type power generation, which comprises: the upper bin, the lower bin, the weight and the weight movement channel; the upper library, the weight moving channel and the lower library are sequentially connected; the weight is lifted to an upper reservoir when moving upwards, so that electric ...

A system for harvesting, storing, and generating energy, that includes floating structure supporting machinery to extract energy from wind, waves, surface generators, or currents. At least one energy storage and power generating unit is anchored to the seafloor and adapted to tether the floating structure to the unit. The unit includes an internal chamber into which water flows ...

Large-scale energy storage technology is crucial to maintaining a high-proportion renewable energy power system stability and addressing the energy crisis and environmental problems.

Abstract: Disclosed herein are AI-based platforms for enabling intelligent orchestration and management of power and energy. In various embodiments, a policy and governance engine is configured to deploy a set of rules and/or policies that govern a set of energy generation, storage, and/or consumption workloads, wherein the rules and/or policies ...

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