

Perpetuum Mobile

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Perpetuum Mobile plays with the infinite energy dreams of the industrial revolution and uses the archetypical design cues of the early industrial machines.

It depicts a retro-utopian industrial future and references the machines and buildings left during some of the development waves from the past, like the one brought by the West Coast Gold Rush. The piece will also remind us of some of the Burning Man vehicles and installations and simultaneously contrast with modern lightweight wind turbines that decorate the rural landscapes of the world.

Perpetuum Mobile, as its name suggests, is always moving. It uses steam and gravity to achieve the constant movement, and generate and store electricity.

The materials used reinforce the retro-futuristic style with modern techniques. The main structural elements are made of laminated timber. These elements are clad with thick stainless-steel panels that add stability and protect the wood from the elements. The panels are bolted on like in a 1930's era futuristic fighter plane. The head of the hammers are made of raw solid steel to give them the necessary weight. As they corrode, they will acquire a natural patina which will also remind us of the derelict machines and structures that litter the deserts of Western US.

How does it work?

The sculpture has a series of hammers that spin up and down on a track. They move up powered by geothermal energy and on their way down they generate electricity. The hammers swing in their axis, on their way up they hang (reducing torque), and they lie horizontally on the way down (adding torque), just like a traditional Perpetuum Mobile. The triangular shape allows to keep some of the hammers on the top of the sculpture to store their energy.

Generation

The geothermal resources of the Fly Ranch allow us to create steam in a closed water loop. The steam passes through a turbine, generating mechanical energy that elevates the hammers up to the top of the generator. Exiting the turbine, the steam flows through a coil cooling the steam to form liquid water that is then pumped back into the ground.

Gravity then brings the hammers down. Each hammer have 3 generators in their base which generate electricity that is fed into to the grid.

Storage

The hammers are independent, at any point in time up to 50% of them can be kept on the top of the sculpture to store energy, and then let go when more energy is needed.

Regulation

The hammers are driven by gravity and can vary their output by changing their falling speed in case of peaks in demand.

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Energy Generation

Each hammer has a 20 kW generator plus two 10 kW generators attached to gears at the base of the hammer arms that produce electrical energy as the weights travel downwards. Each tower can generate up to 240 kW of continuous power 24 hours per day, 7 days per week.

Dimensions

The piece is 30 m High and it is supported by one column.

Cost

All the materials and systems are proven technologies that are readily available and easy to produce. The cost of producing one piece, would be in the order of \$600,000.00 USD.

Environmental Impact

The machine is made out of wood covered by stainless steel for protection and to add structural strength and stability. The hammer heads are made of solid raw steel. All the materials are renewable or 100% recyclable cradle to cradle.

The Perpetuum Mobile is very simple in its function and will require very little maintenance.

The slow movement of the hammers will not affect the birds and will not generate noise, radio waves, wind vortices or magnetic pollution. And will not transmit coronavirus.