SUMMARY OF THE INVENTION

The present embodiments provide a generator having a moving part and a stator, wherein the moving part is a vehicle and the stator is built into the travel path. The stator may then be connected to an electrical system without any reference to the vehicle. The generator may damp the motion of the vehicle and thus use the motion of the vehicle to generate electricity.

According to a first aspect of the present invention, there is provided a linear generator for generating electrical power from momentum of a vehicle, the linear generator comprising a moving part and a stator, wherein the moving part is a powered vehicle moving along a defined path and the stator is built along the defined path, the linear generator being incorporated at least partly into a Faraday cage, thereby to prevent leak of flux.

According to a second aspect of the present invention, there is provided a linear generator for generating electrical power from momentum of a vehicle, the linear generator comprising a moving part and a stator, wherein the moving part is a powered vehicle moving along a defined path and the stator is built along the defined path, the linear generator further comprising at least one convertor configured to convert a frequency dependent on an instantaneous vehicle speed into a fixed output frequency, the linear generator being incorporated at least partly into a Faraday cage, thereby to prevent leak of flux.

According to a third aspect of the present invention, there is provided an elevator and counterweight system in an elevator shaft, wherein the elevator or the counterweight comprise electromagnets and the elevator shaft has coils, and wherein the elevator is controllable to electrify the electromagnets when braking, thereby to provide electromagnetic braking of the elevator and counterweight system, the elevator and counterweight system comprising a linear generator, the linear generator being incorporated at least partly into a Faraday cage, thereby to prevent leak of flux.

According to a fourth aspect of the present invention, there is provided a method of manufacture of a track for a vehicle; the method comprising:

identifying braking regions on said track where braking is likely to be required;

placing wound coils on said braking regions;

connecting said coils to output electricity generated therein; connecting an AC to DC converter and a DC to AC converter between said coils and said output; and

arranging said track and said coils such that a linear generator is formed between said coils and magnets on said vehicle, the linear generator being incorporated at least partly into a Faraday cage, thereby to prevent leak of flux.

There is provided a linear generator for generating electrical power from momentum of a vehicle, the linear generator comprising a moving part and a stator, wherein the moving part is a powered vehicle moving along a defined path and the stator is built along the defined path.

In an embodiment, the moving part comprises a sequence of magnets and the stator comprises wound coils.

In an embodiment, the magnets are electromagnets and the powered vehicle is an electrically powered vehicle.

In an embodiment, the sequence of magnets are arranged on the vehicle to pass over at a predetermined distance from the wound coils.

In an embodiment, the sequence of magnets are of alternating polarity.

In an embodiment, the defined path comprises braking regions and non-braking regions, and the stator is built into the braking regions and not built into the non-braking regions.

In an embodiment, the vehicle comprises a train and the defined path is a railway track.

In an embodiment, the vehicle is an elevator with a counterweight, and the defined path is an elevator shaft.

In an embodiment, the vehicle is an elevator counterweight and the defined path is an elevator shaft.

In an embodiment, the stator comprises an AC to DC convertor to provide a DC output.

In an embodiment, the stator comprises a frequency convertor to provide the stator output at a desired frequency.

In an embodiment, the moving part comprises a sequence of electromagnets and the stator comprises wound coils and the vehicle is configured to electrify the electromagnets when braking.

There is provided a train comprising a sequence of electromagnets on a side adjacent a track having wound coils, and configured to electrify the electromagnets when braking to damp motion of the train.

There is provided a railway track having braking regions and wound coils in the braking regions to help brake passing trains.

There is provided an elevator and counterweight system in an elevator shaft, wherein the elevator or the counterweight comprise electromagnets and the elevator shaft has coils, and wherein the elevator is controllable to electrify the electromagnets when braking, thereby to provide electromagnetic braking of the elevator and counterweight system.

There is provided a method of generating electricity and braking a vehicle at the same time, the method comprising:

applying braking to a moving vehicle;

at least as part of the applying braking, electrifying electromagnets on the vehicle which are located adjacent coils on a track; and

extracting electricity from the coils.

There is provided a method of manufacture of a vehicle for running on a track, the method comprising:

providing the vehicle for running on a track;

providing on the vehicle on a side adjacent the track a sequence of electromagnets; and

connecting the electromagnets to be energized upon application of braking on the vehicle.

There is provided a method of manufacture of a track for a vehicle; the method comprising:

identifying braking regions on the track where braking is likely to be required;

placing wound coils on the braking regions; and

connecting the coils to output electricity generated therein.

The method may comprise setting the coils at a height defining a predetermined distance from corresponding magnets placed on a vehicle intended for travel on the track, and connecting an AC to DC converter between the coils and the output. The method may further comprise connecting a DC to AC converter between the AC to DC converter and the output.

Unless otherwise defined, all technical and/or scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which the invention pertains. Although methods and materials similar or equivalent to those described herein can be used in the practice or testing of embodiments of the invention, exemplary methods and/or materials are described below. In case of conflict, the patent specification, including definitions, will control. In addition, the materials, methods, and examples are illustrative only and are not intended to be necessarily limiting.