We claim components of a system that flies a kite or kites in such a way that the force of the wind on the kite lines varies in magnitude. When the force is large, the lines are let out and energy is imparted into the system. When the force is lesser, less energy is expended to reel the lines back in. The result is a surplus of energy that is harnessed by a consumer, such as a generator or pump.

We acknowledge that such a system in general has long been established as prior art. We claim novel uses and arrangements of the following basic mechanical components: spools, lines, gears/pulleys, chains/belts, freewheels, a flywheel and two planetary gear sets. We describe this system in the following, with items in bold corresponding to labeled items in the included diagrams.

The **left** and **right kite lines** are attached to and wound around **left** and **right line kite line spools**, rotate individually around a shared, fixed **spool axle**. One of the spools is coupled to the outer-ring of the **steering planetary gear**, the other coupled to the planet-ring. This is done with a relative gear ratio such that when the sun gear is fixed, this coupling requires the left and right spools to rotate at the same rate. In the exhibit embodiment, this coupling is via chain-wheels and **chains**. The sun gear and **planetary axle** of the gear set is mounted to the frame such that it is free to rotate, for example in **pillow block bearings**. Rotation of the sun gear affects an adjustment of the relative angular position of the left and right kite line spools, effecting steering of the kite. In the exhibit embodiment, we use a Sturmey Archer 3-speed hub for our planetary gear set, but any planetary gear set would suffice.

By using a planetary gear to adjust the relative position of the kite line spools, we mechanically decouple the sum position of the spools from their relative position, allowing the lines to move in and out in lock-step, based on the combined torque on the two spools, while tightly controlling their relative length.

One or both of these spools is also coupled to a third spool, the **steering transmission spool**. This coupling is either fixed, or, as in the exhibit embodiment, via a **free-wheeling chain wheel** such that the third spool can not effect a positive torque on the kite spools (in other words, push the kite line out). If both kite line spools are connected to the third spool, the couplings need to be via free-wheel in order to allow adjustment of the relative angular position of the left and right spools.

The entire **steering frame** is anchored into **steering pivot anchor**, which is in turn anchored into the **ground** in such a way that the steering frame is free to pivot about an axis perpendicular to the ground, changing the **pivot angle**, as the kite changes position in the sky, allowing the spools to be aligned with the kite lines.

A **transmission line** runs from the steering transmission spool in the steering subsystem, along the axis of the steering subsystem's rotation, to and around the **D/R transmission spool** of the Drive/Recoil subsystem (D/R) . The single force transmitted between the D/R and the kite lines is tensile along this transmission line.

The transmission line spool in the D/R subsystem is coupled to the **sun gear** in the **D/R planetary gear set** in the D/R subsystem. As in the exhibit embodiment, this may be via a **chain-wheel cog hub**, similar to the drive-train of a standard, multi-speed bicycle, or another mechanism that allows changing the gear ratio of this coupling.

The **outer ring** of the D/R planetary gear is coupled to a **flywheel**. In the exhibit embodiment, this is via chain and chain-wheel.

The **planet ring** of the D/R planetary gear is coupled to a component that produces a drag by consuming energy from the flywheel, for example a **generator**. Both of these are also coupled to the **freewheeling chain-wheel on cog hub**. This coupling is via freewheel, so that it can rotate clockwise at a rate greater than the cog hub.

The components including the flywheel and the generator rotate only clockwise (when viewed as in the diagrams).

One end result is that when the components coupled to the planet ring reach an angular velocity such that its freewheel is engaged, subsequent increases in the angular velocity must result in a corresponding increase in the velocity of the flywheel, and its kinetic energy. This is the Drive phase.

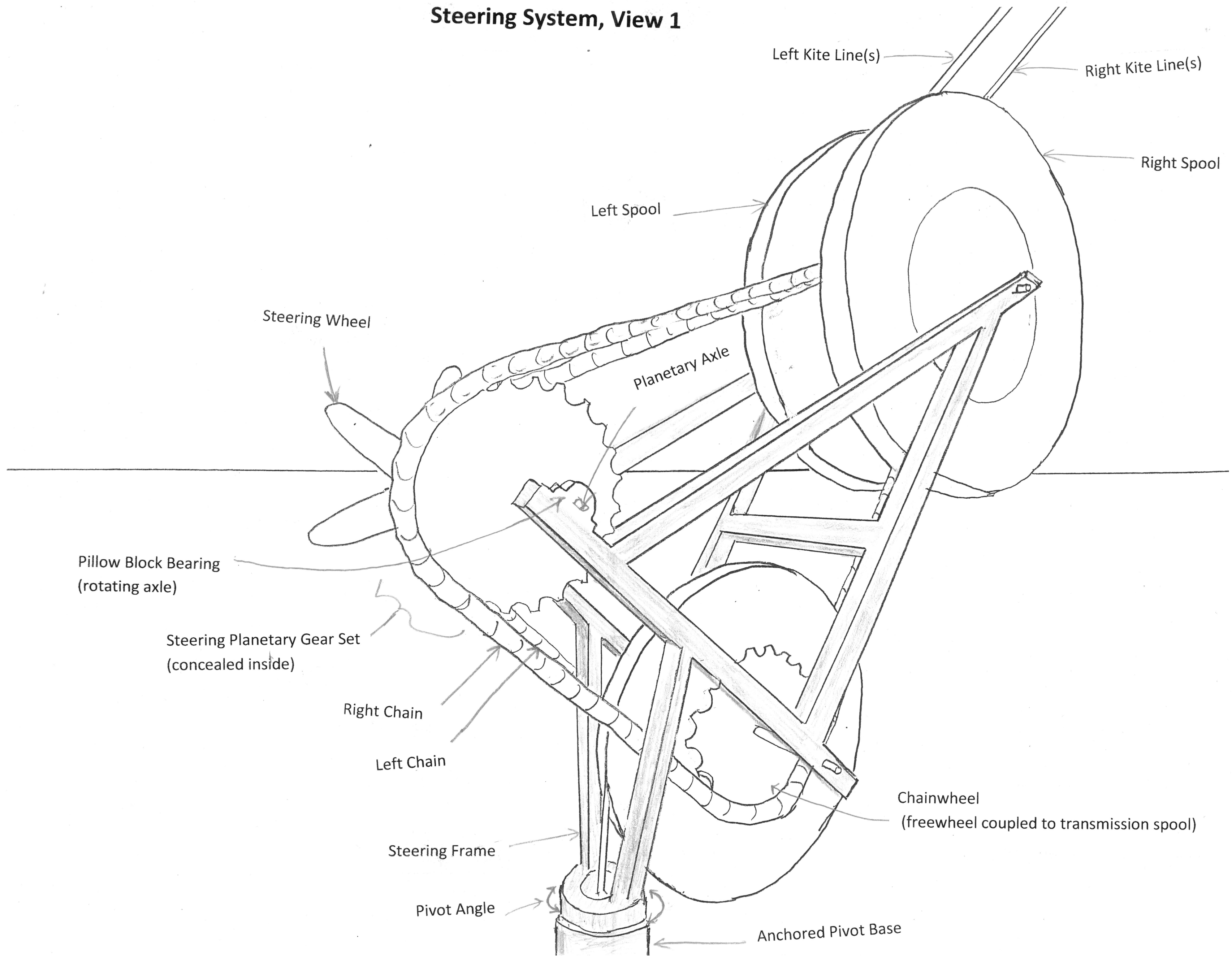
A second result is that when the components coupled to the planet ring slow to an angular velocity less than N times the velocity of the flywheel (for the planetary relation of the exhibit embodiment, N = ¾), the sun gear must rotate counter-clockwise, corresponding to kite line being reeled in. This is the Recoil phase.

The ratio of the coupling between the sun gear and the planet ring effected when the freewheeling chain-wheel on cog hub is engaged can be N to 1 where N is any number between 1/10 and 10. When N, as cited above is greater than 1, resulting increases in angular velocity of the flywheel, corresponding to line going out, are greater than decreases in flywheel velocity resulting from line being reeled in, resulting in an energy surplus.

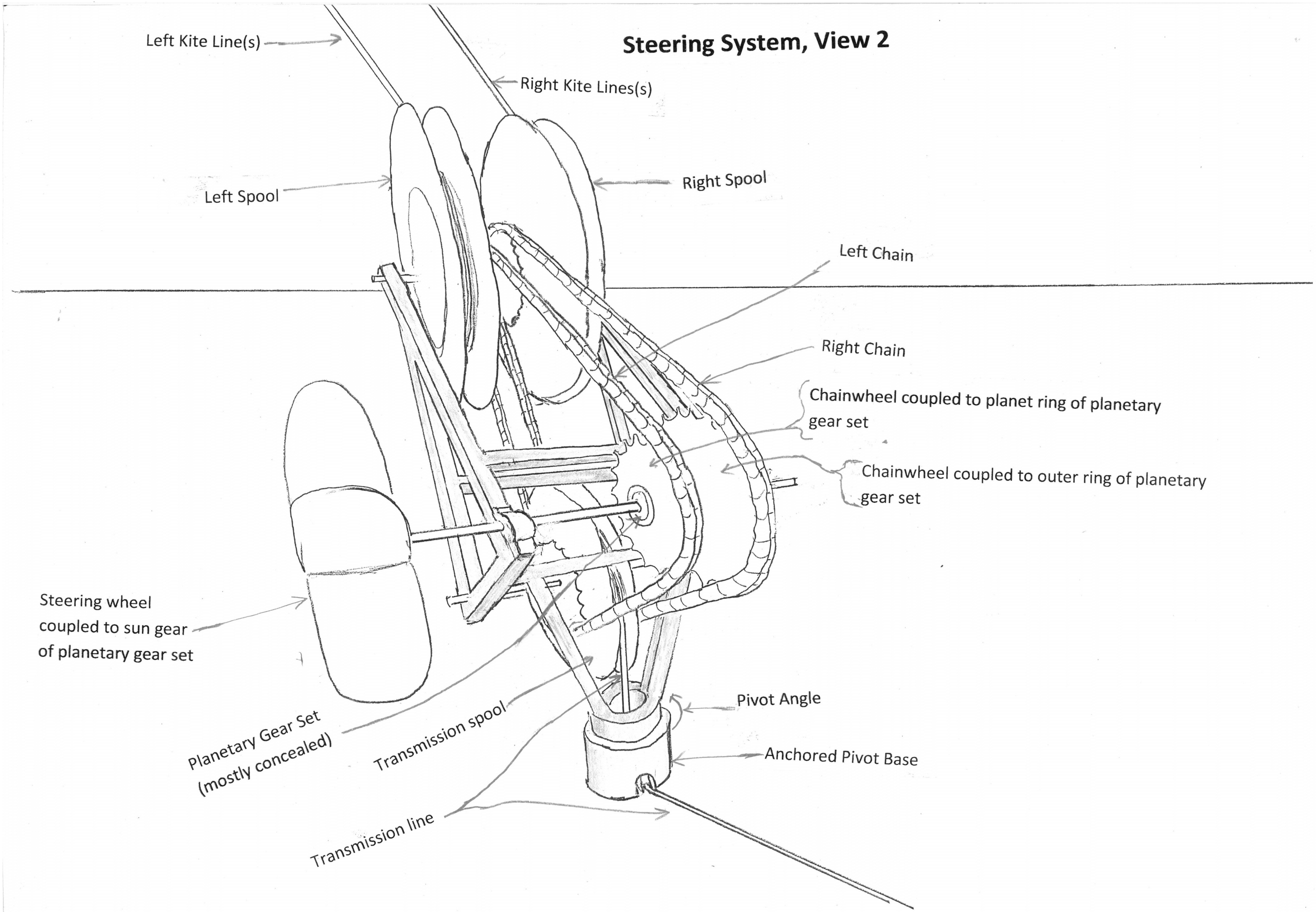
A standard traction kite typically has 4 lines, leading and braking lines on each of the left and right sides. We claim, but do not include in the diagrams, a line guide that will reduce the lateral strain on the spools as the wind pivots the steering subsystem, and a block and tackle arrangement on each of the left and right spool's line guide, through which the braking lines run. By adjusting this block and tackle, altering the relative length of the lead and brake lines, we can partially depower the kite.

We've diagrammed a very specific embodiment using specific components. However, we claim any variant of these components, in any alternate configuration to the same ends.

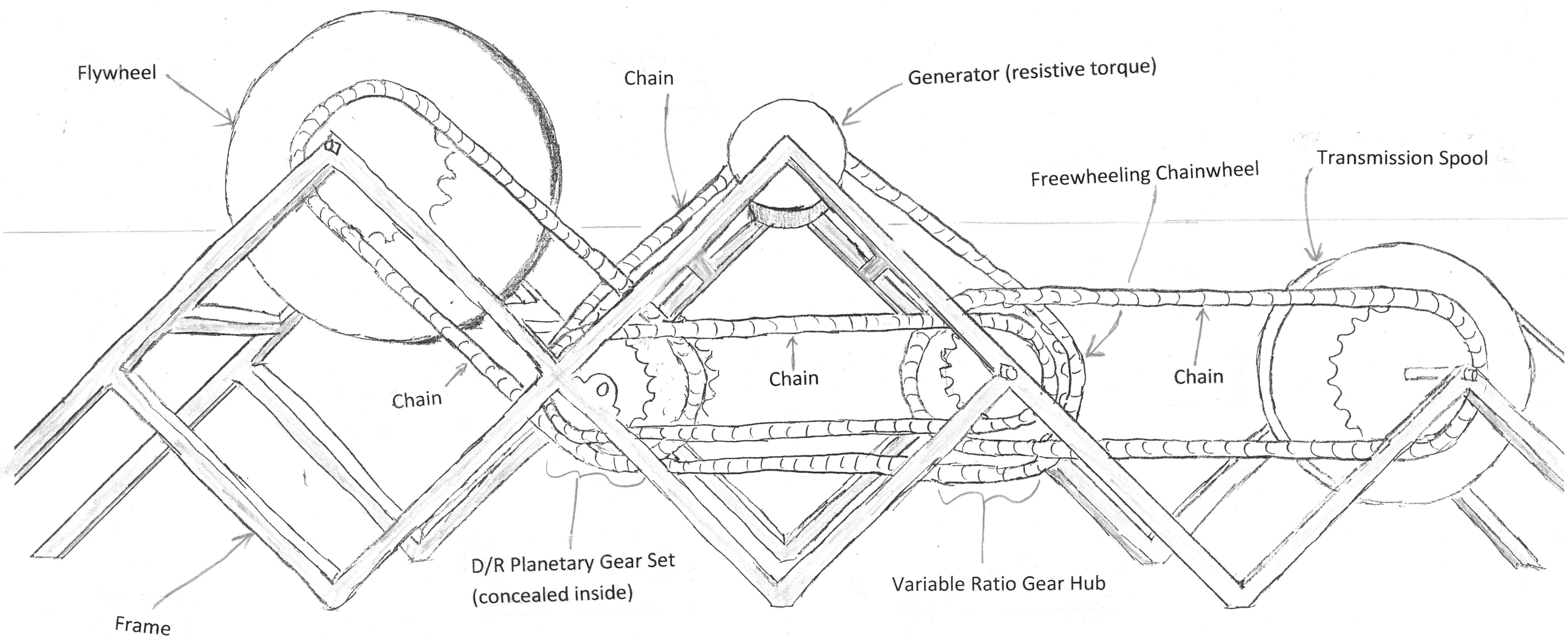
Steering System, View 1



Steering System, View 2



Drive Recoil System



Planetary Gear Set