CLAIMS

1. A lifting vehicle frame, comprising:

an upper vehicle frame;

a lower vehicle frame;

a lifting assembly, the upper vehicle frame and the lower vehicle frame being connected through the lifting assembly, at least two lifting assemblies being provided in a first direction; the lower vehicle frame and the upper vehicle frame being able to move close to or away from each other by operating the at least two lifting assemblies, and each lifting assembly including a lifting motor, a wire rope, and a movable pulley, wherein,

two lifting motors are provided opposite to each other in a second direction, and the two lifting motors are fixed to the upper vehicle frame; the second direction and the first direction are perpendicular to each other;

the movable pulley and the lifting motor are provided correspondingly in one-to-one relation, and two movable pulleys are rotatably disposed on the lower vehicle frame in the second direction; and

the wire rope, the lifting motor and the movable pulley are provided correspondingly in one-to-one relation, and the wire rope has a first end and a second end opposite to each other; the first end and the second end of the wire rope both are wound on an output end of a corresponding lifting motor, and the movable pulley is disposed in the middle of a corresponding wire rope; and

a locking device, the locking device is disposed on the lower vehicle frame; the lower vehicle frame and the upper vehicle frame are locked with each other by operating the locking device when the lower vehicle frame and the upper vehicle frame are close to each other.

2. The lifting vehicle frame according to claim 1, wherein each lifting assembly is provided with a tension sensor.

3. The lifting vehicle frame according to claim 2, wherein an output shaft of each lifting motor is fixedly provided with a reel, and the first end and second end of the wire rope are wound on the reel of a corresponding lifting motor.

4. The lifting vehicle frame according to claim 3, wherein a brake member is provided on the lifting motor;

the brake member and the reel are provided correspondingly in one-to-one relation, and an output end of the brake member operably acts on the reel.

5. The lifting vehicle frame according to claim 1, wherein the locking device comprises:

a rotary pin;

a locking head, fixedly disposed at a head of the rotary pin;

a rotary handle fixedly disposed at a bottom of the rotary pin, the rotary handle is formed with a first limit face and a second limit face on its periphery;

a lifting pin, a central axis of the lifting pin and a central axis of the rotary pin are parallel with each other; the lifting pin operably moves up and down along the central axis of the lifting pin, and the lifting pin is provided with a support protrusion;

a limit block, the limit block is fixedly disposed at a bottom of the lifting pin, and the limit block is operably engaged with the first limit face or the second limit face;

a reset spring, the reset spring is fitted on the lifting pin, and the reset spring is disposed between the support protrusion and the limit block;

a driving mechanism, an output end of the driving mechanism is connected to the rotary handle, and the rotary handle is rotated by operating the driving mechanism; and

wherein the upper vehicle frame is formed with a lock hole corresponding to the locking device at its bottom, and the locking head of the locking device is rotatable within a corresponding lock hole;

a top and bottom of the lower vehicle frame both are formed with a first through hole corresponding to the rotary pin of the locking device;

the rotary pin fixedly passes through corresponding first through holes at the top and bottom of the lower vehicle frame, and the rotary handle is located below a bottom of the lower vehicle frame;

the top and bottom of the lower vehicle frame both are formed with a second through hole corresponding to the lifting pin of the locking device, and the lifting pin is extendable and retractable inside the second through holes at the top and bottom of the lower vehicle frame; and

the reset spring is disposed between a support projection and a partition.

6. The lifting vehicle frame according to claim 5, wherein the rotary pin is provided with a locking seat and a carrying table spaced apart from each other, and the locking seat and the carrying table are sequentially disposed between the locking head and the rotary handle;

a first gap is formed between the locking head and the locking seat, and a top of the lower vehicle frame is clamped in the first gap; and

a second gap is formed between the carrying table and the rotary handle, and the bottom of the lower vehicle frame is clamped in the second gap.

7. The lifting vehicle frame according to claim 6, wherein the locking seat and the carrying table fit with each other with spherical surfaces.

8. The lifting vehicle frame according to claim 5, wherein a bottom of the upper vehicle frame

is formed with a third through hole fitted with the locking device, and the third through hole is passed by a head portion of the lifting pin of a corresponding locking device.

9. The lifting vehicle frame according to claim 5, wherein the locking device further includes a sleeve,

the sleeve is fixedly disposed below a bottom of the lower vehicle frame;

the lifting pin is extendable and retractable in the sleeve, and the limit block is located below the sleeve.

10. An aerial transportation vehicle including the lifting vehicle frame of claim 1.

11. An aerial rail container transportation method implemented by using the aerial transportation vehicle of claim 10, and wherein the aerial transportation vehicle includes the lifting vehicle frame, and the lifting vehicle frame includes the upper vehicle frame, the lower vehicle frame, the lifting assembly and the locking device; the lower vehicle frame and the upper vehicle frame is able to move close to or away from each other by operating the lifting assembly; the lower vehicle frame and the upper vehicle frame close to each other is able to be locked with each other by operating the locking device;

and the method comprises:

the aerial transportation vehicle being free of load and running into position and stopping, so that a container is located directly below the aerial transportation vehicle;

operating the lifting assembly to separate the upper vehicle frame from the lower vehicle frame;

operating the lifting assembly to lower the lower vehicle frame;

opening a container anti-falling device on the lower vehicle frame;

completing a locking of the lower vehicle frame and the container by operating the locking device therebetween;

operating the lifting assembly, so that the lower vehicle frame and the container rise as a whole;

the container anti-falling device on the lower vehicle frame being shrunk so that the container anti-falling device holds the container;

operating the lifting assembly and the locking device so that the lower vehicle frame and the upper vehicle frame are locked with each other; and

the aerial transportation vehicle being started for transportation after a container assembly process is completed.