CLAIMS

What is claimed is:

1. An operation and maintenance system for a rail-transportation locomotive vehicle, characterized by comprising:

an inspection platform;

a set of rails disposed on the inspection platform;

an inspection pit disposed in the inspection platform and corresponding to the set of rails; and

a lifting apparatus mounted in the inspection pit, wherein in a lifting-to-top state, a top of the lifting apparatus is flush with a surface of the inspection platform, wherein the lifting apparatus is disposed between two adjacent set of rails and is in contact with inner walls of both sides of the inspection pit.

~~2. The operation and maintenance system of claim 1, wherein the lifting apparatus is disposed between two adjacent set of rails and is in contact with inner walls of both sides of the inspection pit.~~

~~3~~2. The operation and maintenance system of claim ~~2~~1, wherein the lifting apparatus comprises:

a hoist-type lifting plate;

a bottom mounting frame opposite to the hoist-type lifting plate;

a lifting guide track, wherein one end of the lifting guide track is mounted to the bottom mounting frame, and another end of the lifting guide track is configured to support the hoist-type lifting plate, the lifting guide track along a length direction thereof is in contact with the inspection pit; and

a driving device mounted on the lifting guide track, and configured to move the hoist-type lifting plate upward and downward along the lifting guide track, so that in the lifting-to-top, the hoist-type lifting plate is flush with the surface of the inspection platform.

4~~3~~. The operation and maintenance system of claim ~~3~~2, wherein the driving device comprises:

a driving box;

a driving motor disposed inside the driving box and mounted on the driving box;

a transmission chain disposed inside the driving box, wherein one end of the transmission chain is connected to the driving motor, and another end of the transmission chain is transmissively connected to the hoist-type lifting plate; and

a hoisting wheel disposed inside the driving box, and mounted on the driving box, wherein the transmission chain is wrapped around the hoisting wheel.

~~5~~4. The operation and maintenance system of claim 1, wherein at least one lifting apparatus is respectively disposed at an inner side or an outer side of the set of rails, the lifting apparatus is in contact with an inner wall of the inspection pit, the inner side is the side of the set of rails corresponding to the inspection pit, and the outer side is the side of the set of rails corresponding to the inspection platform;

the set of rails comprises two adjacent rails corresponding to one inspection pit.

~~6~~5. The operation and maintenance system of claim ~~5~~4, comprising at least two sets of rails, at least two inspection pits, and at least two sets of lifting apparatuses, wherein each set of lifting apparatuses comprises two lifting apparatuses respectively disposed at both sides of each set of rails.

~~7~~6. The operation and maintenance system of claim ~~5~~4, wherein at least two sets of lifting apparatus are arranged in a direction perpendicular to an extending direction of the set of rails, and form at least one access route.

~~8~~7. The operation and maintenance system of claim ~~5~~4, wherein the lifting apparatus comprises:

a lifting plate disposed at a side of each set of rails;

a driving device mounted to the lifting plate and configured to drive the lifting plate to ascend and descend vertically;

a distance sensor mounted to the lifting plate and configured to detect a dwelling state of an apparatus on the surface of the lifting plate; and

a control device electrically connected to the drive device and configured to control the driving device to turn on or turn off according to the dwelling state of the apparatus on the surface of the lifting plate.

~~9~~8. The operation and maintenance system of claim ~~8~~7, wherein the control device comprises:

a lifting apparatus control module electrically connected to the driving device and configured to control the driving device; and

a system control scheduler respectively electrically connected to the distance sensor and the lifting apparatus control module, configured to detect an on-site working condition and the dwelling state of the apparatus on the surface of the lifting plate, and control the lifting apparatus control module.

~~10~~9. The operation and maintenance system of claim ~~9~~8, wherein the lifting apparatus control module is connected to an alarm unit, the alarm unit is electrically connected to the system control

scheduler, and configured to output an alarm to remind an inspection apparatus, an inspector, or the operation and maintenance system to stop operations.

~~11~~10. The operation and maintenance system of claim ~~9~~8, further comprising a plurality of support columns, wherein the bottom of each support column is disposed in the inspection pit, and the top of each support column is connected to the bottom of the rail to support the rail, the lifting apparatus is disposed between two adjacent support columns.

~~12~~11. The operation and maintenance system of claim ~~9~~8, wherein at least two lifting apparatuses are arranged at the sides of two adjacent set of rails and in contact with each other, and form an access route in a direction perpendicular to the extending direction of the set of rails, and the at least two lifting apparatuses are located between the two adjacent set of rails;

the access route is configured to communicate the two adjacent inspection pits with each other.

~~13~~12. The operation and maintenance system of claim ~~9~~8, further comprising:

at least one vehicle undercarriage inspection apparatus electrically connected to and communicated with the system control scheduler,

wherein the at least one vehicle undercarriage inspection device is capable of ascending or descending via the lifting apparatus, so as to perform an overhaul and/or a cross-rail overhaul for the rail-transportation locomotive vehicle.

~~14~~13. The operation and maintenance system of claim 1, wherein the lifting apparatus comprises:

a driving device;

a frame structure;

an intercross lifting structure;

a jack-type lifting plate; and

low-position support posts,

wherein the low-position support posts and the intercross lifting structure are both mounted on the frame structure; the jack-type lifting plate is mounted to the intercross lifting structure; the driving device is drivingly connected to the intercross lifting structure to control the intercross lifting structure to be folded or unfolded to move the jack-type lifting plate downward or upward; and the jack-type lifting plate is capable of being in contact with the low-position support posts when the lifting apparatus is in a low position.

~~15~~14. The operation and maintenance system of claim 1, wherein the lifting apparatus comprises:

a lifting apparatus frame structure;

a lifting apparatus driving device;

a lifting apparatus intercross structure;

a lifting apparatus lifting plate;

a foldable support post;

a tie rod; and

a tie rod controller;

wherein the lifting apparatus intercross structure is mounted on the lifting apparatus frame structure; the lifting apparatus driving device is drivingly connected to the lifting apparatus intercross structure; the lifting apparatus lifting plate is mounted on the lifting apparatus intercross structure; the foldable support post is mounted between the lifting apparatus frame structure and the lifting apparatus lifting plate, and comprises a folding-unfolding structure; the tie rod is connected to the foldable support post, and is configured to fold or unfold the folding-unfolding structure; the tie rod controller is connected to the tie rod, and is configured to control the movement of the tie rod to fold or unfold the folding-unfolding structure.