

Personal Hanging Type Double-Rail and Double-Power Automatic Control Light Rail Traffic System

Technical Field

The present invention relates to rail type traffic system, particular to a personal hanging type double-rail and double-power automatic control light rail traffic system. In the present invention, an electric rail vehicle hanging on a light type rail arranged in midair is controlled by computer to run automatically for point-to-point transportation of people and goods.

Background Art

At present, the rail type vehicles commonly used mainly belong to ground rail traffic system, underground rail traffic system and rail traffic system of elevated light rail. Though these rail-type vehicles are large in carryings, fast in speed, safe and reliable, there are widespread shortcomings such as large investment scale, long construction period, long station spacing, and large occupation of urban space resources. Due to these limitations, the rail-type vehicles could only be used for interurban and intra-urban arterial traffic at present. In 1950s, the concept of PRT, a traffic system where small vehicles run automatically on the special rail network or special road network, and the concept of light type rail and personal rail vehicles applied in urban branch line traffic were first put forward by Americans. However both the technical proposal of hanging type signal rail vehicle steering published in the US patent of No.4016818 and PCT patent of No.WO03047903, and the proposal of personal rail traffic in the CN patent of Professor HU YINGPING entitled Autonomously Steering Suspended Single-Track Vehicle of No. CN2005100076552 fail to provide a fast, reliable, simple and reasonable solution for the steering, merging, shunting, stopping at stations and system control of the personal rail vehicle. As a result, the PRT concept has not been applied in practice at home or abroad for nearly 70 years.

Summary of the Invention

The purpose of present invention is to disclose a personal hanging type double-rail and double-power automatic control light rail traffic system for solving the problem that the existing rail vehicles could only run on a traffic artery instead of a normal branch line. And the present invention could be applied to the internal urban traffic like main and secondary roads, small streets

and lanes, the traffic between cities and villages, the interurban traffic, the internal traffic of large venues, as well as the traffic inside of large factories and mines, schools, airports, parks and scenic spots.

The technical solutions in the present invention are as follows:

A personal hanging type double-rail and double-power automatic control light rail traffic system, comprises a track system, a rail vehicle power system, a rail vehicle traffic network control system, a rail vehicle compartment system, a rail vehicle power supply system, and a rail vehicle stop station system;

The track system comprises a track support system and a track(8), the track support system comprises a vertical support column(3) and a horizontal support truss(2), a rail vehicle(1) runs along the track(8), the track(8) comprises a left side straight rail(29) and a right side turning rail(28), the track(8) is installed in the inner cavity of the horizontal support truss (2), the left side straight rail (29), installed on the left side of the cavity, is a mainline rail arranged continuously; the right side turning rail (28), installed on the right side of the cavity, comprises a straight section and a turn section, the straight section thereof is set to be parallel to the left side straight rail (29) with spacing reserved, the top face level of the straight section thereof is higher than that of the left side straight rail (29), the top face level thereof gradually rises while transiting to the turn section from the straight section, the top height difference between the turning and the left side straight rail (29) enables the left side equipment platform (16) of the rail vehicle (1) to deviate from the left side straight rail (29), the right side turning rail (28) curves at the highest point with gradually increasing distance from the left side straight rail (29), and the right side turning rail (28) diverts to the stop station so that the rail vehicle could pull in and stop in the station, or connects to another right side turning rail(28) which is on an intersected or parallel rail line so that the rail vehicle(1) could make a turn, a merging or a shunting;

The rail vehicle power system comprises a compartment boom (20), a rail vehicle power platform (27) and an eccentric support wheel (19), the rail vehicle power platform(27) comprises a left side

equipment platform(16) and a right side equipment platform(17), the left side equipment platform (16) is provided with a front left drive wheel (11) and a rear left driven wheel (13), the right side equipment platform (17) is provided with a front right drive wheel (12), a rear right driven wheel (14) and a lifting device for right side equipment platform (18), the lower end of the carriage boom (20) is provided with an eccentric support wheel (19), and the roll surface of the eccentric support wheel (19) is in contact with the bottom side of the track(8); the compartment boom(20) is flexible connected to the top of the rail vehicle compartment(4) through a turn plate, when the rail vehicle (1) makes a small radius turn, a rotation will be generated between the compartment boom (20) and the rail vehicle compartment (4), the left side equipment platform (16) is installed above the left side straight rail (29), the right side equipment platform (17) is installed above the right side turning rail (28), and the right side equipment platform (17) reciprocates up and down relative to the left side equipment platform (16) through the lifting device for right side equipment platform (18); when the rail vehicle(1) runs straight, due to the left side equipment platform (16) is above the left side straight rail(29), the front left drive wheel (11) and the rear left driven wheel (13) drive the rail vehicle (1) to run straight ahead along the left side straight rail(29), when the rail vehicle(1) needs to turn into the station, to merge, to divert, or to urgently deviate from the left side straight rail(29) due to malfunctions, the entire right side equipment platform (17) moves downward to contact the right side turning rail(28) under the action of the lifting device for right side equipment platform (18), and at the same time the front right drive wheel (12) is started to power the rail vehicle (1), when the rail vehicle(1) gets to the turn section along the straight section of the right side turning rail(28), the top face level thereof gradually rises above that of the left side straight rail(29), and the entire rail vehicle power platform(27) is lifted with the rising level of the right side turning rail (28) so that the left side equipment platform(16) deviates from the left side straight rail(29), then the rail vehicle(1) enters into the turn section on the right side turning rail(28) and turns along the curve to deviate from the left side straight rail(29) thereby realizing the turning of the rail vehicle(1), on the contrary, when the turn section is merged into the straight section, the level of the right side turning rail(28) gradually decreases, and the distance between right side turning rail (28) and left side straight rail (29) are gradually closer, when the straight section on the right side turning rail (28) is arrived, the left side equipment platform (16) contacts the left side straight rail(29), the front left drive wheel(11) on the left side equipment platform(16) is started

and the front right drive wheel(12) on the right side equipment platform(17) is closed, under the action of the lifting device for right side equipment platform(18), the right side equipment platform(17) is lifted and deviated from the right side turning rail(28), and the rail vehicle enters into the state of running straight;

The rail vehicle traffic network control system comprises a central control computer system, an on-board computer control system, a rail signal identification device, and a stop station computer control system, the central control computer system comprises a large central control computer and an auxiliary system thereof, the central control computer collects reservation and destination information of each rail vehicle (1), stop station information, and malfunction information of the track(8) and the rail vehicle (1) for data computing, and implements automatic control over the overall scheduling, operation line design and emergency disposal of malfunctions for the rail vehicle(1), the on-board computer control system comprises an on-board computer, a rail vehicle signal transmitting and receiving device(30), a computer controlled compartment latch(6) and data lines, the on-board computer stores the control procedures for the rail vehicle(1) in various states, when obtaining the target information set by the user on the computer controlled compartment latch (6), the on-board computer uploads the target information to the central control computer, the central control computer calculates the optimal operation line of the rail vehicle (1) and sends the optimal operation line of rail vehicle back to the on-board computer, the on-board computer calculates and processes the signal data collected by the signal transmitting and receiving device (30) to obtain the operation command of the rail vehicle (1), and the on-board computer controls the rail vehicle (1) to accelerate, decelerate and brake by adjusting the input current and voltage of the rail vehicle power platform (27), opening and closing the brake components (15), and enables the rail vehicle(1) to make a turn, a merging or a shunting by starting the lifting device for right side equipment platform (18).

The rail vehicle compartment system comprises a rail vehicle compartment(4), a seat (9), a foldable worktop(10) and a door(5), the rail vehicle compartment(4) is connected with the rail vehicle power platform(27) through two compartment booms(20) on the front and rear, and inside the rail vehicle compartment(4) is provided a computer controlled compartment latch(6), a

compartment video monitoring device, an air condition, lightings, a rail vehicle weight limit device, network, a radio equipment, an emergency calling device and a manual control button.

The rail vehicle power supply system comprises transformer substations arranged along the rail, power transmission lines, a rail vehicle internal power supply system, and a contact wire network of the rail internal power supply(22), the rail vehicle inner power supply system comprises a power receiving contact (23), a rail vehicle distribution box (24), a battery emergency power supply (21), a power platform power supply line, a compartment power supply line, and a weak current system, along the track(8)is arranged transfer substations, each transfer substation is supplied by uninterruptible power from no less than two city power circuits, the transmission line is arranged along the inside of the horizontal support truss (2) to supply power for the power supply contact wire network (22), the internal power supply system of the rail vehicle (1) connects the power supply through the power receiving contact (23) and supplies power for battery emergency power supply (21), rail vehicle power platform (27), rail vehicle compartment (4), and weak current system through the distribution box (24), and the battery emergency power supply (21) is installed on the left side equipment platform (16) of the rail vehicle power platform (27).

Both outer sides of the front left drive wheel (11) and the front right drive wheel (12) are provided with a brake component (15), and the lifting device for right side equipment platform (18) adopts mechanical, electromagnetic or hydraulic mode as the drive power.

The track (8) adopts an inverted L-shaped structure, and the track (8) comprises an inverted L-shaped rail steel plate (25) and a rail support member (26).

The rail vehicle power platform(27) connects the rail vehicle compartment (4) through two compartment booms (20)on the front and rear, both two compartment booms(20) on the front and rear are provided with an eccentric support wheel (19), and the roll surfaces of eccentric support wheels on the front and rear compartment booms(20) are respectively in contact with the left and right sides of the bottom of the track(8) to resist the eccentric moment generated between the compartment booms(20) and the two sides of track(8).

The track(8) is provided with a signal device at the merging point, the appropriate point of the straight rail is provided with a signal receiving and transmitting device of merging signal, when the vehicle passes the merging signal device, the vehicle passing signal is transmitted to the signal receiving and transmitting device of merging signal, and when the running straight rail vehicle passes and obtains the signal that a rail vehicle is merging into the rail, the signal is calculated by the on-board computer thereof to determine whether to accelerate or decelerate so as to yield to the rail vehicle which is merging into the rail.

The rail vehicle(1) running on a track B which is parallel to a track A and a track C, could shunt from the track B onto the track A on the left or onto the track C on the right through a shunting device, the shunting device is a right side turning rail, and the right side turning rail, manufactured into a curve shape, could be connected to the right side turning rail of the track A by bypassing the track B to the left or be connected to the right side turning rail of the track C by bypassing the track C to the right.

The stop station system comprises a hardstand area, a stop station track, a drop-off platform, a pick-up platform, a rail vehicle maintenance platform and a stop station control center, the hardstand area comprises the vacant lot arranged on both sides of the rail line, a basement, and an inner space of a large space building, the stop station track comprises a right side turning rail(28) and at least a left side straight rail(29), the right side turning rail(28) drawn from the turning of the track(8) within the track system, gradually decreases in the height till lower than the bottom of the rail vehicle (1) and just higher than the ground of the stop station, the right side turning rail(28) in stop station curves along the outside of the hardstand area to form an outwardly protruding arc and gradually rises in height after departing from the station to merge into the track(8) within the track system, a left side straight rail(29) of the stop station is arranged inside of the arc, a parallel segment (31) connected with the right side turning rail (28) at both ends of the left side straight rail (29) is provided for rail vehicle (1) to merge into the left side straight rail (29) from the right side turning rail(28) when entering the station, and to shunt from left side straight rail (29) onto the right side turning rail(28) when departing from the station, the left side straight rail (29) of the

stop station is used for the rail vehicle (1) to pick up and drop off passengers, the entrance thereof is set as the drop-off platform, the exit thereof is set as the pick-up platform, and the arc top of the right side turning rail (28) of the stop station is set as the maintenance platform of rail vehicle (1).

The stop station system could be divided into a manned and an unattended stop station or an open and an indoor stop station.

In the present invention, The track system is provided with two rail lines (28, 29), which are a left side straight rail line and a right side turning rail line that are in parallel but are different in top face level, and the two power systems of a left side straight rail drive device and a right side turning rail drive device are separately disposed above the two rails. A relative distance between the turning rail drive device and the turning rail is changed by using a lifting device, and meanwhile, under the effect of a change of the relative level between the straight rail and the turning rail, switching of a rail vehicle between the left side straight rail and the right side turning rail is implemented, thereby the steering, merging, shunting, stopping at stations of the personal rail vehicle are achieved in a safe, simple and fast way. And a central computer control system is used in cooperation in the system to achieve automation control and autonomous circumambulation of rail vehicle so that the PRT concept is truly transformed into an application technology that serves people's lives.

Description of the Figures

Fig.1 is a schematic diagram showing the track support system.

Fig. 2 is a schematic diagram showing the layout of rail vehicle on urban roads.

Fig. 3 is a schematic diagram showing the appearance of rail vehicle.

Fig. 4 is a schematic diagram showing the internal structure of the rail vehicle.

Fig. 5 is a main view of the rail vehicle power system.

Fig.6 is a top view of the rail vehicle power system.

Fig.7 is a lateral view of the rail vehicle power system.

Fig.8 is a main view that the rail vehicle power system runs on the rail.

Fig.9 is a top view that the rail vehicle power system runs on the rail.

Fig.10 is a lateral view that the rail vehicle power system runs on the rail.

Fig.11 is a top view that the rail vehicle makes a merging.

Fig.12 is a lateral view that the rail vehicle makes a merging.

Fig.13 is a top view that the rail vehicle makes a turn.

Fig.14 is a lateral view that the rail vehicle makes a turn.

Fig.15 is a top view that the rail vehicle makes a shunting.

Fig.16 is a lateral view that the rail vehicle makes a shunting.

Fig. 17 is a schematic diagram showing a rail vehicle stop station.

Fig. 18 shows cutaway views at five positions when the rail vehicle in Fig.11 makes a merging.

Fig. 19 shows cutaway views at five positions when the rail vehicle in Fig.15 makes a turn.

Fig.20 shows cutaway views at four positions when the rail vehicle in Fig.11 makes a shunting.

Specific Embodiments

Referred to the attached figures, a personal hanging type double-rail and double-power automatic control light rail traffic system, comprises a track system, a rail vehicle power system, a rail vehicle traffic network control system, a rail vehicle compartment system, a rail vehicle power supply system, and a rail vehicle stop station system.

The track system comprises a track support system and a track(8), the track support system comprises a vertical support column(3) and a horizontal support truss(2), a rail vehicle(1) runs along the track(8), the track(8) comprises a left side straight rail(29) and a right side turning rail(28), the track(8) is installed in the inner cavity of the horizontal support truss (2), the left side straight rail (29), installed on the left side of the cavity, is a mainline rail arranged continuously; the right side turning rail (28), installed on the right side of the cavity, comprises a straight section and a turn section, the straight section thereof is set to be parallel to the left side straight rail (29) with spacing reserved, the top face level of the straight section thereof is higher than that of the left side straight rail (29), the top face level thereof gradually rises while transiting to the turn section from the straight section, the top height difference between the turning and the left side straight rail (29) enables the left side equipment platform (16) of the rail vehicle (1) to deviate from the left side straight rail (29), the right side turning rail (28) curves at the highest point with gradually increasing distance from the left side straight rail (29), and the right side turning rail (28) diverts to the stop station so that the rail vehicle could pull in and stop in the station, or connects to another right side turning rail(28) which is on an intersected or parallel rail line so that the rail vehicle(1) could make a turn, a merging or a shunting.

The track (8) adopts an inverted L-shaped structure, and the track (8) comprises an inverted L-shaped rail steel plate (25) and a rail support member (26).

The spacing, height and structural form of the vertical support column(3) and horizontal support truss(2) of the rail are designed and determined according to the existing topography and buildings of the setting area of the track system. While designing the rail vehicle (1), following means are

adopted to strictly control the load of the rail: 1. the light-weight design is applied to the rail vehicle for controlling the weight of rail vehicle compartment (4) and rail vehicle power platform (27); 2.the load of the rail vehicle is limited through a weight limit device on the compartment boom (20) of the rail vehicle; 3.the distance for a rail vehicle (1) to run on the track(8) is automatically controlled through a distance measuring equipment installed on the front part of rail vehicle so that the number of the rail vehicle(1) runs on the track(8) of unit distance is controlled. Through means above, the load of the rail horizontal support truss is effectively controlled within the minimum range and the size of support member could be the smallest, the horizontal support truss (2) of single rail line could be more than 100 meters, and the track(8), the horizontal support truss (2) and the rail vehicle (1) only occupy an air passage with a width of no more than 2 meters, a height of no more than 3 meters and a distance of 5 to 15 meters from the ground. Therefore the layout of horizontal support truss (2) could be flexible and changeable, and could overcome various obstacles such as urban roads, bridges, small buildings and trees. The traffic rail lines inside the urban could be arranged above the green belts of the main roads, the slow lanes, the roadside green belts or, the green space in the parks, or under the viaducts or between the residential buildings. The traffic rail lines between the urban and rural could be arranged on both sides of the existing roads, or above the farmlands, woods or hills; the inter-city traffic lines could be arranged on both sides of ordinary existing highways and expressways between cities, and the existing tunnels could help the vehicle to cross mountains and highlands. The internal traffic lines of large factories, mines, schools, airports, parks, and scenic spots could be arranged on both sides of the existing roads or arbitrarily above the open space within the areas. And the rail lines inside the large stadium buildings could be designed specifically when the buildings are designed.

The rail vehicle power system comprises a compartment boom (20), a rail vehicle power platform (27) and an eccentric support wheel (19), the rail vehicle power platform(27) comprises a left side equipment the right side equipment platform (17) is provided with a front right drive wheel (12), a rear right driven wheel (14) and a lifting device for right side equipment platform (18), the lower end of the carriage boom (20) is provided with an eccentric support wheel (19), and the roll surface of the eccentric support wheel (19) is in contact with the bottom side of the track(8); the compartment boom(20) is flexible connected to the top of the rail vehicle compartment(4) through

a turn plate, when the rail vehicle (1) makes a small radius turn, a rotation will be generated between the compartment boom (20) and the rail vehicle compartment (4), the left side equipment platform (16) is installed above the left side straight rail (29), the right side equipment platform (17) is installed above the right side turning rail (28), and the right side equipment platform (17) reciprocates up and down relative to the left side equipment platform (16) through the lifting device for right side equipment platform (18); when the rail vehicle(1) runs straight, due to the left side equipment platform (16) is above the left side straight rail(29), the front left drive wheel (11) and the rear left driven wheel (13) drive the rail vehicle (1)to run straight ahead along the left side straight rail(29), when the rail vehicle(1) needs to turn into the station, to merge, to divert, or to urgently deviate from the left side straight rail(29) due to malfunctions, the entire right side equipment platform (17) moves downward to contact the right side turning rail(28) under the action of the lifting device for right side equipment platform (18), and at the same time the front right drive wheel (12) is started to power the rail vehicle (1), when the rail vehicle(1) gets to the turn section along the straight section of the right side turning rail(28), the top face level thereof gradually rises above that of the left side straight rail(29), and the entire rail vehicle power platform(27) is lifted with the rising level of the right side turning rail (28) so that the left side equipment platform(16) deviates from the left side straight rail(29), the rail vehicle(1) enters into the turn section on the right side turning rail(28) and turns along the curve to deviate from the left side straight rail(29) thereby realizing the turning of the rail vehicle(1), on the contrary, when the turn section is merged into the straight section, the level of the right side turning rail(28) gradually decreases, and the distance between right side turning rail (28) and left side straight rail (29) are gradually closer, when the straight section on the right side turning rail (28)is arrived, the left side equipment platform (16)contacts the left side straight rail(29), the front left drive wheel(11) on the left side equipment platform(16) is started and the front right drive wheel(12) on the right side equipment platform(17) is closed, under the action of the lifting device for right side equipment platform(18), the right side equipment platform(17) is lifted and deviated from the right side turning rail(28), and the rail vehicle enters into the state of running straight;

Both outer sides of the front left drive wheel (11) and the front right drive wheel (12) are provided with a brake component (15), and the lifting device for right side equipment platform (18) adopts

mechanical, electromagnetic or hydraulic mode as the drive power.

The rail vehicle power platform(27) connects the rail vehicle compartment (4) through two compartment booms (20) on the front and rear, both two compartment booms(20) on the front and rear are provided with an eccentric support wheel (19), and the roll surfaces of eccentric support wheels on the front and rear compartment booms(20) are respectively in contact with the left and right sides of the bottom of the track(8) to resist the eccentric moment generated between the compartment booms(20) and the two sides of track(8). The two compartment booms (20) on the front and rear are adopted could effectively resist the torque generated by the braking of rail vehicle and increase the riding comfort, and if the single boom is adopted, the rail vehicle power system and control system would be simple and reliable, but the compartment would swing so largely at the accelerating, decelerating and braking of the rail vehicle that affects the riding comfort. And inside of the compartment boom (20) is provided a steel spring shock absorber or an air spring shock absorber which could absorb most of kinetic energy at the accelerating, decelerating and braking of the rail vehicle, thereby increasing the stability and comfort of compartment during the running.

The rail vehicle traffic network control system comprises a central control computer system, an on-board computer control system, a rail signal identification device, and a stop station computer control system, the central control computer system comprises a large central control computer and an auxiliary system thereof, the central control computer collects reservation and destination information of each rail vehicle (1), stop station information, and malfunction information of the track(8) and the rail vehicle (1) for data computing, and implements automatic control over the overall scheduling, operation line design and emergency disposal of malfunctions for the rail vehicle(1), the on-board computer control system comprises an on-board computer, a rail vehicle signal transmitting and receiving device(30), a computer controlled compartment latch(6) and data lines, the on-board computer stores the control procedures for the rail vehicle(1) in various states, when obtaining the target information set by the user on the computer controlled compartment latch (6), the on-board computer uploads the target information to the central control computer, the central control computer calculates the optimal operation line of the rail vehicle (1) and sends

the optimal operation line of rail vehicle back to the on-board computer, the on-board computer calculates and processes the signal data collected by the signal transmitting and receiving device (30) to obtain the operation command of the rail vehicle (1), and the on-board computer controls the rail vehicle (1) to accelerate, decelerate and brake by adjusting the input current and voltage of the rail vehicle power platform (27), opening and closing the brake components (15), and enables the rail vehicle(1) to make a turn, a merging or a shunting by starting the lifting device for right side equipment platform (18).

The stop station control system comprises station control computers and a stop station track monitoring system, and the station control computers connected to the central control computer to receive relevant instructions. And each stop station is provided with a stop station control center responsible for controlling the arrival of the rail vehicle at the stop station, passenger getting on and off, departure, maintenance and management of rail vehicle.

The rail signal identification device is arranged at a position for the rail vehicle to make a turn, a merging, a shunting or stop at the stop station and the rail vehicle starts the set operational procedure by scanning and identifying the signal. The rail and the truss are provided with a deformation and stress monitoring device. And all the control and monitoring systems transmit the data through data lines or wireless network.

The rail vehicle compartment system comprises a rail vehicle compartment(4), a seat(9), a foldable worktop (10) and a door(5), the rail vehicle compartment(4) is connected with the rail vehicle power platform(27) through two compartment booms(20) on the front and rear, and inside the rail vehicle compartment(4) is provided a computer controlled compartment latch(6), a compartment video monitoring device, an air condition, lightings, a rail vehicle weight limit device, network, a radio equipment, an emergency calling device and a manual control button. The rail vehicle compartment (4) comprising a base plate, a steel frame structure, a maintenance plate, glass windows, a seat (9) and a door (5), has a height of the car is 1.2m ~ 1.5 m, a width of 1.0m ~ 1.5 m, and a length of 1.5m ~2m. The rail vehicle is available in two models, one is for single passenger, and the other is for double passengers, with a certain space for storing personal belongings. The

door (5) to be opened and closed is controlled by a computer controlled compartment latch (6). The computer controlled compartment latch (6) is a data control computer installed outside the compartment, connected to the on-board computer and with the functions like identification, goal setting, collecting fee, opening and closing the door(5). By means of the computer controlled compartment latch (6), the passenger finishes the functions of identification, destination setting and automatically paying the fee, after then the door (5) automatically opens for passenger to enter into the compartment(4) and have a seat. On the front top of compartment (4) is provided a monitoring system to record the condition of internal compartment and the images on the monitoring system are synchronized to the data of the central monitoring center. The rail vehicle is provided with an air conditioning system to offer suitable environment temperature in the rail vehicle compartment (4). The rail vehicle provided with a lighting system enables the passenger to control brightness of the light. At the connection of the compartment boom (20) and the compartment is provided an automatic metrological control system for compartment loading. The total weight of the compartment and its load is controlled within a certain range of 200kg to 300kg, and when the weight range is exceeded, the system automatically alarms and restricts the start. The weight limit device could effectively guarantee the maximum weight of a single compartment, effectively control the load range of horizontal truss, and maximize the transport capacity of track(8) under the premise of ensuring system safety. While running, the rail vehicle (1) could provide wireless network service and radio service so that the passenger could work and enjoy entertainment in the compartment. The rail vehicle traffic system adopts full automatic control so that the passenger couldn't control over those like running speed and direction of the rail vehicle (1), and when the system is abnormal, the passenger could contact the central control center through an emergency call. When the emergency call is started by a passenger, the central control center displays all the information of the rail vehicle which the passenger takes, communicates with the passenger through the video phone, and takes timely measures to deal with the situation. And when the passenger changes the destination temporarily, he could start the manual control button, select the nearest exit and reset the route.

The rail vehicle power supply system comprises transformer substations arranged along the rail, power transmission lines, a rail vehicle internal power supply system, and a contact wire network

of the rail internal power supply(22), the rail vehicle inner power supply system comprises a power receiving contact (23), a rail vehicle distribution box (24), a battery emergency power supply (21), a power platform power supply line, a compartment power supply line, and a weak current system, along the track(8)is arranged transfer substations, each transfer substation is supplied by uninterruptible power from no less than two city power circuits, the transmission line is arranged along the inside of the horizontal support truss (2) to supply power for the power supply contact wire network (22), the internal power supply system of the rail vehicle (1) connects the power supply through the power receiving contact (23) and supplies power for battery emergency power supply (21), rail vehicle power platform (27), rail vehicle compartment (4), and weak current system through the distribution box (24), and the battery emergency power supply (21) is installed on the left side equipment platform (16) of the rail vehicle power platform (27).

The stop station system comprises a hardstand area, a stop station track, a drop-off platform, a pick-up platform, a rail vehicle maintenance platform and a stop station control center, the hardstand area comprises vacant lot arranged on both sides of the rail line, a basement, and an inner space of a large space building, the stop station track comprises a right side turning rail(28) and one or more left side straight rail(29), the right side turning rail(28) drawn from the turning of the track(8) within the track system, gradually decreases in the height till lower than the bottom of the rail vehicle (1) and just higher than the ground of the stop station, the right side turning rail(28) in stop station curves along the outside of the hardstand area to form an outwardly protruding arc and gradually rises in height after departing from the station to merge into the track(8)within the track system, a left side straight rail(29) of the stop station is arranged inside of the arc, a parallel segment (31) connected with the right side turning rail (28) at both ends of the left side straight rail (29) is provided for rail vehicle (1) to merge into the left side straight rail (29) from the right side turning rail(28) when entering into the station, and to shunt from left side straight rail (29) onto the right side turning rail(28) when departing from the station, the left side straight rail (29) of the stop station is used for the rail vehicle (1) to pick up and drop off passengers, the entrance thereof is set as the drop-off platform, the exit thereof is set as the pick-up platform, and the arc top of the right side turning rail (28) of the stop station is set as the maintenance platform of rail vehicle (1).

The stop station system could be divided into a manned and an unattended stop station or an open and an indoor stop station.

The working principle of the present invention, the personal hanging type double-rail and double-power automatic control light rail traffic system will be described in details as follows:

Vehicle reservation: In order to realize reasonable vehicle deployment, a user could reserve a vehicle one day or several hours in advance by logging into the vehicle scheduling website through a mobile phone or a computer according to own needs. The central control computer collects the user's reservation information for overall calculation, and arranges the vehicle to wait at the reserved time and address of the user. The central control computer could calculate the cost according to the length of the user's appointment time, and arrange the priority ride. And those who fail to use the vehicle or break the appointment at the agreed time would be surcharged for taking or imposed a certain amount of money for punishment.

Route setting and payment: The user takes the reserved rail vehicle (1) at the agreed place and time. While arriving, the rail vehicle (1) identifies the passenger through scanning a mobile phone or IC card, and opens the computer controlled compartment latch (6). And as to set the target station, the computer controlled compartment latch (6) is adopted to be inputted the station digital encoding, character name or phonetic name, then to accordingly display the name and fee of target station on the screen thereof for user to confirm, and to open the door after deducting the fee.

Board and start operation: The rail vehicle is available in two models, one is for one single passenger, and the other is for double passengers. Inside the vehicle is provided a certain space for storing luggage and personal belongings. When the passenger with luggage boards the vehicle, the total weight thereof is weighed by the load weight limit device. If the total weight is greater than the rated weight, the alarm alerts and the vehicle doesn't start. When the total weight is within the normal limits, the rail vehicle(1) automatically closes the door and the on-board computer automatically starts the operation, then the front left drive wheel (11) on the rail vehicle power

platform (27) is started, the rail vehicle runs along the left side straight rail (29) ahead and starts the turn procedure at the connection with the right side turning rail (28), after completing the turn procedure, the rail vehicle(1) pulls out of the stop station along the right side turning rail(28). And the broadcast inside the compartment will have voice prompts for destination, trip distance, time and matters needing attention.

Make a merging: When the rail vehicle (1) reaches the left side straight rail (29) along the right side turning rail (28), the rail vehicle signal transmitting and receiving device (30) passes the rail signal device to scan the signal, and the on-board computer receives the signal to start the merging procedure: firstly the front left drive wheel (11) and the lifting device for right side equipment platform(18) on rail vehicle power platform (27) is started, then the right side equipment platform(17) runs upwards, the front left drive wheel(11) and rear left driven wheel(13) contact the left side straight rail(29) so that the rail vehicle is driven to run straight, then the front right drive wheel(12) and rear right driven wheel(14) stop running, the right side equipment platform(17) is lifted to deviate from the right side turning rail(28), and the rail vehicle(1) driven by the front left drive wheel(11) runs straight along the left side straight rail(2) ahead.

]Run Straight: When running straight, the rail vehicle (1) driven by the front left drive wheel (11) runs on the left side straight rail (29), the speed thereof could be set within 40 to 80km/h, the spacing could be controlled within 10m to 20m, and the spacing between the rail vehicles could be automatically controlled by the distance measuring equipment installed on the front of the rail vehicle. The acceleration and deceleration of the rail vehicle could be operated through increasing or decreasing the motor current or voltage of the drive wheel. And for emergency brake, the brake components could be started.

When a running straight vehicle encounters another merging vehicle from the turning rail, the rail vehicle (1) adopts acceleration or deceleration to yield. the track(8) is provided with a signal device at the merging point, the appropriate point of the straight rail is provided with a signal receiving and transmitting device of merging signal, when the vehicle passes the merging signal device, the vehicle passing signal is transmitted to the signal receiving and transmitting device of merging

signal, and when the running straight rail vehicle passes and obtains the signal that a rail vehicle is merging into the rail, the signal is calculated by the on-board computer thereof to determine whether to accelerate or decelerate so as to yield to the rail vehicle which is merging into the rail.

Make a turn: The rail vehicle signal transmitting and receiving device(30) scans the signal transmitted by the rail signal identification device installed at the turning, and if the signal is computed and determined by the on-board computer to be the set turning, the turn procedure is started as follows: the rail vehicle power platform(27) starts the lifting device for right side equipment platform(18), the right side equipment platform(17) runs downwards, then the front right drive wheel(12) and rear right driven wheel(14) contacts the right side turning rail(28) so that the front right drive wheel(12) is started to run along the right side turning rail(28) ahead, as the right side turning rail(28) is gradually lifted higher than the left side straight rail(29), the entire rail vehicle power platform(27) is lifted so that the left side equipment platform(16) deviates from the left side straight rail(29) and the front left drive wheel(11) stops running, then the turn section on the right side turning rail(28) is gradually away from the left side straight rail(29), and the rail vehicle(1) turns along the right side turning rail(28) thereby deviating from the left side straight rail(29).

Make a shunting: On a busy road is provided more than two parallel lines. The rail vehicle(1) running on a track B which is parallel to a track A and a track C, could shunt from the track B onto the track A on the left or onto the track C on the right through a shunting device, the shunting device is a right side turning rail, and the right side turning rail, manufactured into a curve shape, could be connected to the right side turning rail of the track A by bypassing the track B to the left or be connected to the right side turning rail of the track C by bypassing the track C to the right. When the rail vehicle(1) passes the shunting point, the signal transmitting and receiving device(30) scans the rail signal device, and if the set shunting point is computed and determined by the on-board computer, the turn procedure is started as follows: the rail vehicle(1) firstly starts the turn procedure, and the rail vehicle(1) turns along the right side turning rail(28) to deviate from the track B, then bypasses the track B to the left along the shunting device, and starts the merging procedure when getting to the right of the track A and merges into the track A; or then bypasses

the track C to the right along the shunting device, and starts the merging procedure when getting to the right of the track C and merges into the track C.

Pull into: The turning on the track (8) for pulling into station is provided with a rail signal device. When the rail vehicle (1) passes by, the signal transmitting and receiving device (30) thereon scans the rail signal device. If the signal is computed and determined to be the turning by the on-board computer or the passenger starts the manual control button, the turn procedure is started. When turning into the station for a maintenance, the rail vehicle ((1) could runs along the right side turning rail (28) directly to the maintenance area; when pulling into the station for dropping off or picking up the passenger, the rail vehicle starts a merging procedure at the parallel segment of the left side turning rail (29) and the right side straight rail (28), then the rail vehicle (1) enters into the left side straight rail(29) of the stop station, and stops at the dropping-off area to automatically open the door for passenger to get off, after then the rail vehicle(1) automatically closes the door and stops at the picking-up area for passenger to get on. The rail vehicle(1) doesn't start running until the passenger gets on, and the turn procedure thereof is started at the parallel segment of the left side turning rail (29) and the right side straight rail (28) so that the rail vehicle pulls out of the station along the right side turning rail(28) and merges into the main rail.

Measures for malfunction emergency disposal are as follows:

1. Make an emergency turn into station because of mechanical breakdown of the rail vehicle (1): the rail vehicle (1) is designed to adopt a power system of four independent drive wheels, two are installed on the left of rail vehicle and two are on the right of rail vehicle. When one front left drive wheel (11) is broken down, the other still drives the rail vehicle to run at a normal speed; when both two drive wheels are broken down, the rail vehicle automatically starts turn procedure so that the right side equipment platform (16) moves downwards to be started, and the rail vehicle is driven to make a turn and deviate from the straight running rail. And on the right are also provided with two right drive wheels, when one drive wheel is broken down, the other wheel still drives the rail vehicle to run at a normal speed and deviate from the main rail so that the fault rail vehicle doesn't affect the running of other straight running rail vehicles.

2. Start the emergency power supply and turn into station because of power supply failure: the rail vehicle (1) is provided with a storage battery (21) to be an emergency power supply, when the external power supply of the rail vehicle (1) fails, the battery emergency power supply (21) is started instantly and the turn procedure is started to stop at the nearest station.

3. Rail vehicle operating obstacle monitoring and distance control device: on the front of the rail vehicle is provided a laser scanning and distance measuring system which could automatically scan the obstacles ahead and rail vehicle(1) ahead in the running process. And when the distance from the obstacles ahead or the rail vehicle (1) ahead is shorter than the safe distance, the deceleration procedure is automatically started to keep safe distance with the rail vehicle(1) ahead or to slow down and stop before the obstacles.

4. Rail malfunction monitoring and emergency turn: The components like the track(8), the horizontal support truss (2) and vertical support column (3) are provided with a stress and deformation monitoring device to timely monitor the stress and deformation of those components like the track, truss and support column, caused by external force or their selves. And when the stress and deformation exceed safe range, the central control computer forces the nearby rail vehicle (1) to make an emergency turn and avoid the dangerous lines.

5. Rail vehicle malfunction inspection and maintenance: When broken down, the rail vehicle (1) makes a turn into the nearest station and stops at the maintenance area for repair.

Referred to the attached figures, the detailed descriptions are as follows:

Fig.1 shows the interrelations among the rail vehicle, truss and column. The rail where the rail vehicle (1) runs is installed inside of the cavity of the horizontal support truss (2) and the vertical support column (3) supports the horizontal support truss (2). Due to the rail vehicle adopts light weight design, the horizontal support truss (2) is less loaded so that the span of the horizontal support truss (2) could be over 100m, the section height of truss could be within 1.5m to 2.5m, the

height of column could be within 5m to 15m, and the section height of column could be 0.8m to 1.5 m.

Fig. 2 shows the layout of rail vehicle on urban roads. The layout of rail vehicle (1) on a normal urban road could be designed in three basic forms. The first one is that the horizontal support truss (2) and the vertical support column (3) are arranged on the pavement and the rail vehicle runs above the pavement; the second one is the horizontal support truss (2) and the vertical support column (3) are arranged on the central green belt and the rail vehicle (1) runs above the central green belt; and the third one is gantry support frame and the rail vehicle (1) runs above the slow traffic lane.

Fig. 3 and Fig.4 show the appearance and internal structure of rail vehicle. The Fig.3 shows the appearance of rail vehicle. The outer structure comprises the rail vehicle compartment(4), the front windshield(7), the door(5), two compartment booms on the front and rear(20) and the computer controlled compartment latch(6), and the connection between the compartment boom(20) and the rail vehicle compartment(4) is provided with the weight limit device. The compartment boom(20) is connected to the top of the rail vehicle compartment(4) through a turn plate, when the rail vehicle (1) makes a small radius turn, a rotation will be generated between the compartment boom (20) and the rail vehicle compartment (4). The Fig.4 shows internal structure of rail vehicle. The internal structure comprises the seat (9), the foldable worktop (10) and the appropriate positions in rail vehicle compartment are provided with the a compartment video monitoring device, air conditions, lightings, network, radio equipment, emergency calling devices and manual control buttons. On the front of compartment is provided a signal transmitting and receiving device (30) and rail vehicle distance measuring equipment and at the rear of compartment is provided a luggage storing place.

Fig. 5 -7 show the rail vehicle power system. The Fig. 5 is the plan view of the rail vehicle power system (27), the Fig.6 is the side level of the rail vehicle power system, and the Fig.7 is the front and rear level of the rail vehicle power system (27). The rail vehicle power system (27) comprises two equipment platforms of metal structure, a left side equipment platform (16) and a right side

equipment platform (17). On the front and rear of the left side equipment platform(16) are respectively provided a front left drive wheel (11) and a rear left driven wheel (13), and on the front left drive wheel (11) is provided a brake component (15). On the left side equipment platform (16) is also provided equipment like a battery emergency power supply (21), a distribution box (24), a power receiving contact (23) and an on-board computer. On the front and the rear of the right side equipment platform (17) are respectively provided a front right drive wheel (12) and a rear right driven wheel (14), and on the front right drive wheel(12) is provided a brake component (15), the right side equipment platform (17) reciprocates up and down relative to the left side equipment platform (16) through the lifting device for right side equipment platform (18) and the rail vehicle power platform connects the compartment(4) through the compartment boom(20).

Fig. 8 -10 show the interrelation between the track (8) and the rail vehicle power platform (27). The track (8) comprises a left side straight rail (29) and a right side turning rail (28). The rail on each side comprises an inverted L-shaped rail steel plate (25) and a rail support member (26). The rail support member (26) is welded firmly to the rail steel plate at one end and the other end thereof is welded firmly to the horizontal support truss (2). The position where the compartment boom is above the bottom of the inverted L-shaped track(8) is provided with an eccentric support wheel(19), the eccentric support wheel(19) is in contact with the side edge of left side and right side rails to resist the eccentric moment generated among the compartment boom (20) and rails on two sides. The left side equipment platform (16) is installed above the left side straight rail (29), the right side equipment platform (17) is installed above the right side turning rail (28), and the top face level of left side straight rail (29) is lower than that of the straight section on the right side turning rail (28). When transiting to the turn section from the straight section, the right side turning rail (28) gradually rises in top face level along the running direction of the rail vehicle and the top height difference between the turning and the left side straight rail (29) enables the left side equipment platform (16) of the rail vehicle to deviate from the left side straight rail (29), the right side turning rail (28) curves at the highest point with gradually increasing distance from the left side straight rail (29), and the right side turning rail (28) diverts to the stop station so that the rail vehicle could pull in and stop in the station, or connects to another right side turning rail(28)which is on an intersected or parallel rail line so that the rail vehicle(1) could make a turn, a merging or

a shunting.

The Fig.11, Fig.12 and Fig.18 show the rail vehicle makes a merging and runs straight. When the rail vehicle (1) reaches the left side straight rail (29) along the right side turning rail (28), the signal transmitting and receiving device (30) bypasses the rail signal device to scan the signal, and the on-board computer receives the signal to start the merging procedure: Firstly the front left drive wheel(11) of the left side equipment platform(16) on the rail vehicle power platform(27) and the lifting device for right side equipment platform(18) are started, the right side equipment platform(17) runs upwards, the front left drive wheel(11) and rear left driven wheel(13) contact the left side straight rail(29) so that the rail vehicle is driven to run straight, then the front right drive wheel(12) and rear right driven wheel(14) stop running, the right side equipment platform(17) is lifted to deviate from the right side turning rail(28), and the rail vehicle(1) driven by the front left drive wheel(11) runs straight along the left side straight rail(2) ahead, thereby completing the merging procedure. In Fig.18, the cutaway views 1-1, 2-2 and 3-3 show the process that the rail vehicle (1) gradually approaches the left side straight rail (29) from the right side turning rail (28); the cutaway view 4-4 shows the left side equipment platform(16) contacts the left side straight rail(29) to start the front left drive wheel(11) on the left side equipment platform(16); and the cutaway view 5-5 shows the lifting device for right side equipment platform(18) is started so that the right side equipment platform(17) is lifted to deviate from the right side turning rail(28) and the rail vehicle(1) is driven by the left side equipment platform to run straight on the left side straight rail(29).

The Fig.13, Fig.14 and Fig.19 show the rail vehicle makes a turn. The signal transmitting and receiving device (30) on rail vehicle scans the signal transmitted by the rail signal identification device installed at the turning, and the turn procedure is started as follows when the signal is determined to be the set turning by the on-board computer: The lifting device for right side equipment platform (18) is started by the rail vehicle power platform (27) firstly, the right side equipment platform (17) runs upwards, the front right drive wheel(12) and the rear right driven wheel(14) contact the right side turning rail(28) so that the front right drive wheel(12) is started to run along the right side rail ahead, then with the right side turning rail(28) gradually being lifted

above the left side straight rail(29), the rail vehicle power platform(27) is lifted so that the left side equipment platform(16) is driven to deviate from the left side rail, and the front left drive wheel(11) stops running. The right side turning rail (28) is gradually away from the left side straight rail (29) after the curve, and the rail vehicle(1) makes a turn along the right side turning rail(28) to deviate from the left side straight rail(29), thereby completing the turn procedure. In Fig.19, the cutaway view 1-1 shows the straight running state of the rail vehicle power platform (27), the left side equipment platform (16) attaches to the left side straight rail (29), the right side equipment platform (17) is lifted by the lifting device for right side equipment platform (18) and there is a certain gap from the right side turning rail (28); the cutaway view 2-2 shows the entire right side equipment platform (17) is dropped by the lifting device for right side equipment platform (18), and the right side equipment platform (17) contacts the right side turning rail(28) to start the front right drive wheel(12) on the right side equipment platform(17); The cutaway view 3-3 shows that with the rail vehicle power platform running ahead, the top face level of the right side turning rail(28) is gradually lifted above the left side straight rail(29), the entire right side equipment platform(17) with the rail vehicle power platform(27) is lifted so that the left side equipment platform(16) is lifted to deviate from left side straight rail(29) and the front left drive wheel(11) stops running; and the cutaway view 4-4 and the cutaway view 5-5 show that the right side equipment platform(17) runs on the right side turning rail(28), and the distance from the right side turning rail(28) to the left side straight rail(29) gradually becomes larger so that the rail vehicle(1) deviates from the straight rail and enters into the turning rail.

Fig.15, Fig.16 and Fig.20 show the rail vehicle makes a shunting. On the busy road is provided more than two parallel lines. The rail vehicle(1) running on a track B which is parallel to a track A and a C, could shunt from the track B onto the track A on the left or onto the track C on the right through a shunting device, the shunting device is a right side turning rail, and the right side turning rail, manufactured into a curve shape, could be connected to the right side turning rail of the track A by bypassing the track B to the left or be connected to the right side turning rail of the track C by bypassing the track C to the right. When the rail vehicle(1) passes the shunting point, the signal transmitting and receiving device(30) scans the rail signal device, and if the set shunting point is computed and determined by the on-board computer, the turn procedure is started as follows: the

turn procedure is firstly started, and the rail vehicle(1) turns along the right side turning rail(28) to deviate from the track B, then bypasses the track B to the left along the shunting device, starts the merging procedure when getting to the right of the track A and merges into the track A; or bypasses the track C to the right along the shunting device, starts the merging procedure when getting the right of the track C and merges into the track C, thereby completing the shunting procedure. In Fig.20, the cutaway view 1-1 shows the rail vehicle(1) runs straight on the track B before making a shunting, and the left side equipment platform(16) runs straight on the left side straight rail(29); the cutaway view 2-2 and the cutaway view 3-3 show the rail vehicle starts the turn procedure, the right side equipment platform(17) runs on the right side turning rail(28) , and the shunting device guides the rail vehicle to bypass the track C along the curve; and the cutaway view 4-4 shows the merging procedure is started and the rail vehicle makes a merging into the track C.

The Fig.17 is the schematic diagram showing the rail vehicle pulls into the stop station. The turning on the straight rail for pulling into station is provided with a rail signal device. When passing by, the signal transmitting and receiving device (30) of the rail vehicle scans the turn signal of the rail signal device. If the turn signal is determined by the on-board computer or the passenger starts the manual control button, the turn procedure is started. When turning into the station for a maintenance, the rail vehicle ((1) could run along the right side turning rail (28) directly to the maintenance area; when pulling into the station for dropping off or picking up passengers, the rail vehicle starts a merging procedure at the parallel segment of the left side turning rail (29) and the right side straight rail (28), then the rail vehicle (1) enters into the left side straight rail(29) of the stop station, and stops at the dropping-off area to automatically open the door for passenger to get off, after then, the rail vehicle(1) automatically closes the door and stops at the picking-up area for passenger to get on. And the rail vehicle (1) doesn't start until the passenger gets on, and the turn procedure thereof is started at the parallel segment of the left side turning rail (29) and the right side straight rail (28) so that the rail vehicle pulls out of the station along the right side turning rail (28) and makes a merging into the main rail.

Claims

1. A personal hanging type double-rail and double-power automatic control light rail traffic system, comprising a track system, a rail vehicle power system, a rail vehicle traffic network control system, a rail vehicle compartment system, a rail vehicle power supply system, and a rail vehicle stop station system, characterized in that: the track system comprises a track support system and a track(8), the track support system comprises a vertical support column(3) and a horizontal support truss(2), a rail vehicle(1) runs along the track(8), the track(8) comprises a left side straight rail(29) and a right side turning rail(28), the track(8) is installed in the inner cavity of the horizontal support truss (2), the left side straight rail (29), installed on the left side of the cavity, is a mainline rail arranged continuously; the right side turning rail (28), installed on the right side of the cavity, comprises a straight section and a turn section, the straight section thereof is set to be parallel to the left side straight rail (29) with spacing reserved, the top face level of the straight section thereof is higher than that of the left side straight rail (29), the top face level thereof gradually rises while transiting to the turn section from the straight section, the top height difference between the turning and the left side straight rail (29) enables the left side equipment platform (16) of the rail vehicle (1) to deviate from the left side straight rail (29), the right side turning rail (28) curves at the highest point with gradually increasing distance from the left side straight rail (29), and the right side turning rail (28) diverts to the stop station so that the rail vehicle could pull in and stop in the station, or connects to another right side turning rail(28) which is on an intersected or parallel rail line so that the rail vehicle(1) could make a turn, a merging or a shunting; the rail vehicle power system comprises a compartment boom (20), a rail vehicle power platform (27) and an eccentric support wheel (19), the rail vehicle power platform(27) comprises a left side equipment platform(16) and a right side equipment platform(17), the left side equipment platform (16) is provided with a front left drive wheel (11) and a rear left driven wheel (13), the right side equipment platform (17) is provided with a front right drive wheel (12), a rear right driven wheel (14) and a lifting device for right side equipment platform (18), the lower end of the carriage boom (20) is provided with an eccentric support wheel (19), and the roll surface of the eccentric support wheel (19) is in contact with the bottom side of the track(8); the compartment boom(20) is flexible connected to the top of the rail vehicle compartment(4)

through a turn plate, when the rail vehicle (1) makes a small radius turn, a rotation will be generated between the compartment boom (20) and the rail vehicle compartment (4), the left side equipment platform (16) is installed above the left side straight rail (29), the right side equipment platform (17) is installed above the right side turning rail (28), and the right side equipment platform (17) reciprocates up and down relative to the left side equipment platform (16) through the lifting device for right side equipment platform (18); when the rail vehicle(1) runs straight, due to the left side equipment platform (16) is above the left side straight rail(29), the front left drive wheel (11) and the rear left driven wheel (13) drive the rail vehicle (1)to run straight ahead along the left side straight rail(29), when the rail vehicle(1) needs to turn into the station, to make a mergingto make a shunting, or to urgently deviate from the left side straight rail(29) due to malfunctions, the entire right side equipment platform (17) moves downward to contact the right side turning rail(28) under the action of the lifting device for right side equipment platform (18), and at the same time the front right drive wheel (12) is started to power the rail vehicle (1), when the rail vehicle(1) gets to the turn section along the straight section of the right side turning rail(28), the top face level thereof gradually rises above that of the left side straight rail(29), and the entire rail vehicle power platform(27) is lifted with the rising level of the right side turning rail (28) so that the left side equipment platform(16) deviates from the left side straight rail(29), then the rail vehicle(1) enters into the turn section on the right side turning rail(28) and turns along the curve to deviate from the left side straight rail(29) thereby realizing the turning of the rail vehicle(1), on the contrary, when the turn section is merged into the straight section, the level of the right side turning rail(28) gradually decreases, and the distance between right side turning rail (28) and left side straight rail (29) are gradually closer, when the straight section on the right side turning rail (28)is arrived, the left side equipment platform (16)contacts the left side straight rail(29), the front left drive wheel(11) on the left side equipment platform(16) is started and the front right drive wheel(12) on the right side equipment platform(17) is closed, under the action of the lifting device for right side equipment platform(18), the right side equipment platform(17) is lifted and deviated from the right side turning rail(28), and the rail vehicle enters into the state of running straight; the rail vehicle traffic network control system comprises a central control computer system, an on-board computer control system, a rail signal identification device, and a stop station

computer control system, the central control computer system comprises a large central control computer and an auxiliary system thereof, the central control computer collects reservation and destination information of each rail vehicle (1), stop station information, and malfunction information of the track(8) and the rail vehicle (1) for data computing, and implements automatic control over the overall scheduling, operation line design and emergency disposal of malfunctions for the rail vehicle(1), the on-board computer control system comprises an on-board computer, a rail vehicle signal transmitting and receiving device(30), a computer controlled compartment latch(6) and data lines, the on-board computer stores the control procedures for the rail vehicle(1) in various states, when obtaining the target information set by the user on the computer controlled compartment latch (6), the on-board computer uploads the target information to the central control computer, the central control computer calculates the optimal operation line of the rail vehicle (1) and sends the optimal operation line of rail vehicle back to the on-board computer, the on-board computer calculates and processes the signal data collected by the signal transmitting and receiving device (30) to obtain the operation command of the rail vehicle (1), and the on-board computer controls the rail vehicle (1) to accelerate, decelerate and brake by adjusting the input current and voltage of the rail vehicle power platform (27), opening and closing the brake components (15), and enables the rail vehicle(1) to make a turn, a merging or a shunting by starting the lifting device for right side equipment platform (18).

2. The rail traffic system in accordance to claim 1, characterized in that the rail vehicle compartment system comprises a rail vehicle compartment(4), a seat(9), a foldable worktop (10) and a door(5), the rail vehicle compartment(4) is connected with the rail vehicle power platform (27) through two compartment booms(20) on the front and rear, and inside the rail vehicle compartment(4) is provided a computer controlled compartment latch(6), a compartment video monitoring device, an air condition, lightings, a rail vehicle weight limit device, network, a radio equipment, an emergency calling device and a manual control button.
3. The rail traffic system in accordance to claim 1, characterized in that the rail vehicle power supply system comprises transformer substations arranged along the way, power transmission

lines, a rail vehicle internal power supply system, and a contact wire network of the rail internal power supply(22), the rail vehicle inner power supply system comprises a power receiving contact (23), a rail vehicle distribution box (24), a battery emergency power supply (21), a power platform power supply line, a compartment power supply line, and a weak current system, along the track(8)is arranged transfer substations, each transfer substation is supplied by uninterruptible power from no less than two city power circuits, the transmission line is arranged along the inside of the horizontal support truss (2) to supply power for the power supply contact wire network (22), the internal power supply system of the rail vehicle (1) connects the power supply through the power receiving contact (23) and supplies power for battery emergency power supply (21), rail vehicle power platform (27), rail vehicle compartment (4), and weak current system through the distribution box (24), and the battery emergency power supply (21) is installed on the left side equipment platform (16) of the rail vehicle power platform (27).

4. The rail traffic system in accordance to claim 1, characterized in that both outer sides of the front left drive wheel (11) and the front right drive wheel (12) are provided with a brake component (15), and the lifting device for right side equipment platform (18) adopts mechanical, electromagnetic or hydraulic mode as the drive power.
5. The rail traffic system in accordance to claim 1, characterized in that the track (8) adopts an inverted L-shaped structure, and the track (8) comprises an inverted L-shaped rail steel plate (25) and a rail support member (26).
6. The rail traffic system in accordance to claim 1, characterized in that the rail vehicle power platform(27) connects the rail vehicle compartment (4) through two compartment booms (20)on the front and rear, both two compartment booms(20) on the front and rear are provided with an eccentric support wheel (19), and the roll surfaces of eccentric support wheels on the front and rear compartment booms(20) are respectively in contact with the left and right sides of the bottom of the track(8) to resist the eccentric moment generated between the compartment booms(20) and the two sides of track(8).

7. The rail traffic system in accordance to claim 1, characterized in that the track(8) is provided with a merging signal device at the merging point, the appropriate point of the straight rail is provided with a signal receiving and transmitting device of merging signal, when the vehicle passes the merging signal device, the vehicle passing signal is transmitted to the signal receiving and transmitting device of merging signal, and when the running straight rail vehicle passes and obtains the signal that a rail vehicle is merging into the rail, the signal is calculated by the on-board computer thereof to determine whether to accelerate or decelerate so as to yield to the rail vehicle which is merging into the rail.
8. The rail traffic system in accordance to claim 1, characterized in that the rail vehicle(1) running on a track B which is parallel to a track A and a track C, could shunt from the track B onto the track A on the left or onto the track C on the right through a shunting device, the shunting device is a right side turning rail, and the right side turning rail, manufactured into a curve shape, could be connected to the right side turning rail of the track A by bypassing the track B to the left or be connected to the right side turning rail of the track C by bypassing the track C to the right.
9. The rail traffic system in accordance to claim 1, characterized in that the stop station system comprises a hardstand area, a stop station track, a drop-off platform, a pick-up platform, a rail vehicle maintenance platform and a stop station control center, the hardstand area comprises the vacant lot arranged on both sides of the rail line, a basement, and an inner space of a large space building, the stop station track comprises a right side turning rail(28) and at least a left side straight rail(29), the right side turning rail(28) drawn from the turning of the track(8) within the track system, gradually decreases in the height till lower than the bottom of the rail vehicle (1) and just higher than the ground of the stop station, the right side turning rail(28) in stop station curves along the outside of the hardstand area to form an outwardly protruding arc and gradually rises in height after departing from the station to merge into the track(8) within the track system, a left side straight rail(29) of the stop station is arranged inside of the arc, a parallel segment (31) connected with the right side turning rail (28) at both ends of the left side

straight rail (29) is provided for rail vehicle (1) to merge into the left side straight rail (29) from the right side turning rail(28) when entering the station, and to shunt from left side straight rail (29) onto the right side turning rail(28) when departing from the station, the left side straight rail (29) of the stop station is used for the rail vehicle (1) to pick up and drop off passengers, the entrance thereof is set as the drop-off platform, the exit thereof is set as the pick-up platform, and the arc top of the right side turning rail (28) of the stop station is set as the maintenance platform of rail vehicle (1).