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The ~~PRESENT~~ PRESENT OF RECEPTION...relates...to a railway

transport installation of the type comprising a railway vehicle equipped with an electric traction motor, a running track for the railway vehicle including two
 5 parallel stretches of rails, and means for supplying electricity for the motor of the railway vehicle.

Electrically propelled tramways are widely used to provide transport for travellers in urban and suburban areas. The railway vehicles employed are then
 10 in direct contact with the people and the vehicles moving around nearby.

For reasons of safety, present-day tramways are powered by virtue of a current pick-up formed by a rod or pantograph operating in conjunction with an overhead
 15 wire or catenary extending over the entire length of the tramway running track.

Such an installation therefore requires a catenary to be installed above the track, held on posts or on buildings by transverse support cables. The
 20 multiplicity of overhead cables and wires detracts from the visual appearance of cities, and thus limits the scope for installing tramway lines.

The object of the invention is to provide a railway transport installation not exhibiting the
 25 abovementioned drawback, in being devoid of catenaries for supplying power for the railway vehicles, while being of no danger from the electrical point of view for the people or the vehicles moving around in the immediate vicinity.

30 To this end, the subject of the invention is a railway transport installation of the abovementioned type, characterized in that at least one of the stretches of rails is subdivided into successive segments electrically isolated from one another, the
 35 length of each segment being less than the total length of the railway vehicle, in that the means for supplying power for the electric motor include means, carried by the railway vehicle, for picking up current from the two stretches of rails, which stretches of rails are

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supplied with power from an electrical energy source, and in that the power supply means further comprise, on the one hand, switching means configured to selectively control the individual electrical energy supply to each
5 segment of rail, and, on the other hand, means for driving the said switching means so as to cause the electrical energy source to be connected to at least one segment of rail which is completely masked below the railway vehicle, and to disconnect the segments of
10 rail which are not completely masked by a railway vehicle.

According to particular embodiments of the installation, it includes one or more of the following characteristics:

15 - the means for picking up current from the two stretches of rails are arranged substantially in the mid-part of the length of the railway vehicle, and the length of each segment of rail is less than half the length of the railway vehicle;

20 - the current pick-up means include, for each stretch of rails, a conducting wiper configured to rub the surface of the rail;

- the railway vehicle includes, associated with each stretch of rails, at least one wheel the running
25 tread of which, applied to each stretch of rails, is conducting, and the current pick-up means include means for electrically linking the running tread of each wheel to the electric motor;

- the conducting running tread of at least one
30 wheel of the railway vehicle is electrically isolated from the central body of the wheel by an insulating ring;

- the successive segments of rails are separated longitudinally by insulating inserts;

35 - the said insulating inserts include spindles the ends of which are each accommodated in a housing formed at the end in the thickness of the two successive segments of rail;



- the said drive means include triggering means, integral with the structure of the railway vehicle, and means for controlling the switching means, which control means are distributed along the track and
5 are configured to interact with the triggering means when the railway vehicle passes;

- the triggering means include a transmitter configured to transmit a triggering signal, and the control means include a receiver configured to receive
10 the triggering signal so as to control the switching means upon receiving the signal for the triggering;

- the triggering means include a magnet or a movable device and the control means include movable mechanical means which can be shifted under the control
15 of the magnet between two positions corresponding to the connection and disconnection of the adjacent segments of rails; and

- the track is at least partially integrated into the roadway of a street.

20 The invention will be better understood on reading the description which will follow, given solely by way of example and with reference to the attached drawings, in which:

- Figure 1 is a view in diagrammatic
25 perspective of a section of a railway transport installation according to the invention;

- Figure 2 is a view in perspective, on a larger scale, of the linking of two successive segments of rails of a stretch of rails of the track of the
30 installation of Figure 1;

- Figure 3 is a view in cross section of the railway vehicle and of the running track of Figure 1; and

- Figure 4 is a view in section of the axle of
35 Figure 3.

The installation according to the invention essentially includes a network of running tracks 10 on which articulated railway vehicles 12 run, for example tramways. In Figure 1, only one section of running



track is represented on which the railway vehicle 12 is moving along the direction of the arrow F1.

The track 10 includes two parallel stretches of rails 14, 15. These stretches of rails are formed by grooved metal rails integrated into the roadway 16 intended for the movement of motor vehicles and the passage of pedestrians. The stretches of rails 14, 15 rest on sleepers which are not represented, buried in the roadway in Figure 1.

The first stretch of rails 14 includes a succession of segments of rails denoted 14A, 14B, 14C, 14D. These are spaced from one another by gaps 17A, 17B, 17C. They are electrically isolated from one another.

As represented in Figure 2, the successive segments of grooved rails can be held spaced apart axially by insulating inserts 18. The latter include, for example, a spindle of an insulating material, the ends of which are accommodated in blind holes formed in the thickness of the opposing ends of the segments of rails.

In a variant which is not represented, the insert 18 includes a spacer interposed between the two ends of the successive segments of rails and extending along the entire section of the stretch of rails.

Advantageously, the length of each segment of rails of the first stretch of rails 14 of the entire rail network is less than half the total length of the railway vehicle 12. For example, the segments of rails have a length l which is substantially equal to 10 m in the case of a railway vehicle of a total length of 25 m.

The second stretch of rails 15 is electrically continuous, all the rails being linked electrically together.

The two stretches of rails 14, 15 are supplied with electric current by an electrical energy source 20.



The second stretch of rails 15 serves as the current return and is linked by a single buried wire 21 to the source 20.

5 The successive segments of the first stretch of rails 14 are each linked to a common power supply wire denoted 22 by means of individual switching means 24. These switching means are, for example, semiconductor elements.

10 The common power supply wire 22 is buried in the roadway 16 beside the first stretch of rails 14, following its entire length.

The switching means 24 are configured, under the control of drive means designated by the overall reference 25, to selectively cause each segment of
15 rails to be individually connected to or disconnected from the common power supply wire 22 and thus the electrical energy source 20.

Various embodiments of the drive means 25 shown diagrammatically in Figure 3 are described in the rest
20 of the description.

In the example represented, the railway vehicle 12 includes an articulated body 40 delimiting a compartment for transporting passengers. It is supported by two end bogies 42A and a central bogie 42B
25 arranged in the mid-part of the vehicle. Each bogie includes two axles.

The wheels of the end bogies 42A are electrically isolated from the body 40.

In contrast, at least one of the axles, denoted
30 44 and represented in Figure 3, of the central bogie 42B is equipped with means 46 for picking up current from the two stretches of rails 14 and 15.

The vehicle 12 further includes an electric traction motor 48 linked by a mechanical transmission
35 system to at least one of the axles of the vehicle.

The axle 44 is represented in more detail in Figure 4. A first wheel 52 is associated with the first stretch of rails 14, while the second wheel 54 is associated with the second stretch of rails 15. Each



wheel includes a central body 56, 58. These are linked by a transverse shaft 60.

Each wheel has a metal running tread 62, 64, fitted on its inner periphery with a bead 66, 68. The
5 running treads 62, 64 are integrated into the cores 56, 58 by insulating peripheral rings 70, 72 produced, for example, from rubber and furthermore forming dampers.

The ring 70 provides electrical insulation between the running tread 62 and the wheel body 56.

10 The wheel 54 includes one or more linking conductors 76 providing the electrical link between the wheel body 78 and the running tread 64 despite the presence of the ring 72.

The current pick-up means 46 include a
15 conducting wiper 78, 80 for each wheel 52, 54, rubbing laterally on the inner surface of the running treads 62, 64. These wipers are linked to the terminals of the traction motor 48 in order to supply it with power.

According to one particular embodiment of the
20 railway vehicle, the current pick-up means 46 further or only include conducting wipers 82 configured to rub directly on the upper surface of each stretch of rails.

According to yet another particular embodiment, the conducting current return wiper 80 rubs directly on
25 the core 58, or on the shaft 60, by means of conventional contacts.

The drive means 25 include, on the one hand, triggering means 84 carried by the body of the vehicle and, on the other hand, means 86 for controlling the
30 switching means 24. The control means are arranged in the roadway 16 all along the stretch of rails 14. The triggering means 84 are affixed internally at the bottom of the lateral edge of the vehicle in its mid-part.

35 The means 25 for driving the switching means 24 are configured to cause the energy source 20 to be connected to at least one segment of rail 14C which is completely masked below the railway vehicle 12 and



disconnected from all the segments of rail which are not completely masked by a railway vehicle 12.

In the embodiment represented, the control means 86 arranged along the first stretch of rails 14
5 include radio-frequency receivers arranged at each junction between two successive segments of rail, that is to say beside the gaps 17A, 17B, 17C.

These receivers are linked to the switching means 24 by a control network 88 represented in Figure
10 1.

These control means 86 are configured to interact with the triggering means 84 carried by the vehicle 12 and consisting of radio-frequency transmitters. These triggering means 84 are configured
15 to send out a predetermined triggering signal, recognized by the control means 86 when the mid-part of the vehicle 12 passes in line with a receiver.

The installation described here operates in the following way.

20 When the triggering means 84 pass in line with the control means 86 arranged between two successive segments of rail, the control means 86 receiving the triggering signal actuate the switching means 24 of the upstream and downstream segments of rail, considering
25 the direction of forward movement of the vehicle. They control them so as to cause the downstream segment to be disconnected from the power supply wire 24 and, simultaneously, they cause the upstream segment to be connected to the power supply wire 22.

30 Hence it can be understood that the current pick-up means 46, arranged in the mid-part of the vehicle, are constantly in contact with one segment of the first stretch of rails 14 which are supplied with electric current, which allows for continuous traction
35 of the vehicle via the motor 48.

The segment of rail which is supplied with power is completely covered by the railway vehicle 12, so that it is not accessible by the road users, the



lateral edges of the vehicle protecting access to the powered segment of rail.

All the other segments of rail which are not arranged below a vehicle are disconnected from the
5 common power supply wire 22, thus removing any risk for the users of the road.

The absence of a catenary allows the visual appearance of the installation to be enhanced.

According to one particular embodiment which is
10 not represented, the triggering means include a magnet or a movable mechanical device, and the control means include movable mechanical means which can be shifted under the control of the magnet between two positions corresponding to the connection and the disconnection
15 of the adjacent segments of rail. The shifting of the mechanical means controls the change of state by the switching means associated with the upstream and downstream segments causing them to be connected and disconnected respectively.





CLAIMS

1. Railway transport installation of the type comprising a railway vehicle (12) equipped with an electric traction motor (48), a running track (10) for the railway vehicle including two parallel stretches (14, 15) of rails, and means for supplying electricity for the motor (48) of the railway vehicle (12), characterized in that at least one (14) of the stretches of rails is subdivided into successive segments (14A, 14B, 14C, 14D) electrically isolated from one another, the length of each segment being less than the total length of the railway vehicle (12), in that the means for supplying power for the electric motor (48) include means, carried by the railway vehicle (12), for picking up current from the two stretches (14, 15) of rails, which stretches (14, 15) of rails are supplied with power from an electrical energy source (20), and in that the power supply means further comprise, on the one hand, switching means (24) configured to selectively control the individual electrical energy supply to each segment (14A, 14B, 14C, 14D) of rail, and, on the other hand, means (25) for driving the said switching means (24) so as to cause the electrical energy source (20) to be connected to at least one segment of rail (14C) which is completely masked below the railway vehicle (12), and to disconnect the segments (14A, 14B, 14D) of rail which are not completely masked by a railway vehicle (12).

2. Installation according to Claim 1, characterized in that the means for picking up current (46) from the two stretches (14, 15) of rails are arranged substantially in the mid-part of the length of the railway vehicle (12), and the length of each segment (14A, 14B, 14C, 14D) of rail is less than half the length of the railway vehicle (12).

3. Installation according to Claim 1 or 2, characterized in that the current pick-up means (46)





include, for each stretch of rails (14, 15), a conducting wiper (82) configured to rub the surface of the rail.

4. Installation according to any one of the preceding claims, characterized in that the railway vehicle (12) includes, associated with each stretch of rails (14, 15), at least one wheel (52, 54) the running tread (62, 64) of which, applied to each stretch of rails (14, 15), is conducting, and the current pick-up means (46) include means (50) for electrically linking the running tread (62, 64) of each wheel to the electric motor (48).

5. Installation according to Claim 4, characterized in that the conducting running-tread (62) of at least one wheel of the railway vehicle (12) is electrically isolated from the central body (56) of the wheel by an insulating ring (70).

6. Installation according to any one of the preceding claims, characterized in that the successive segments (14A, 14B, 14C, 14D) of rails are separated longitudinally by insulating inserts (28).

7. Installation according to Claim 6, characterized in that the said insulating inserts include spindles (18) the ends of which are each accommodated in a housing formed at the end in the thickness of the two successive segments of rail.

8. Installation according to any one of the preceding claims, characterized in that the said drive means (25) include triggering means (84) integral with the structure of the railway vehicle (12), and means (86) for controlling the switching means (24), which control means (86) are distributed along the track (10) and are configured to interact with the triggering means (84) when the railway vehicle (12) passes.

9. Installation according to Claim 8, characterized in that the triggering means (84) include a transmitter configured to transmit a triggering signal, and in that the control means (86) include a receiver configured to receive the triggering signal so





as to control the switching means (24) upon receiving the signal for the triggering.

10. Installation according to Claim 8, characterized in that the triggering means include a magnet or a movable device and the control means include movable mechanical means which can be shifted under the control of the magnet between two positions corresponding to the connection and disconnection of the adjacent segments of rails.
- 10 11. Installation according to any one of the preceding claims, characterized in that the track (10) is at least partially integrated into the roadway (16) of a street.

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