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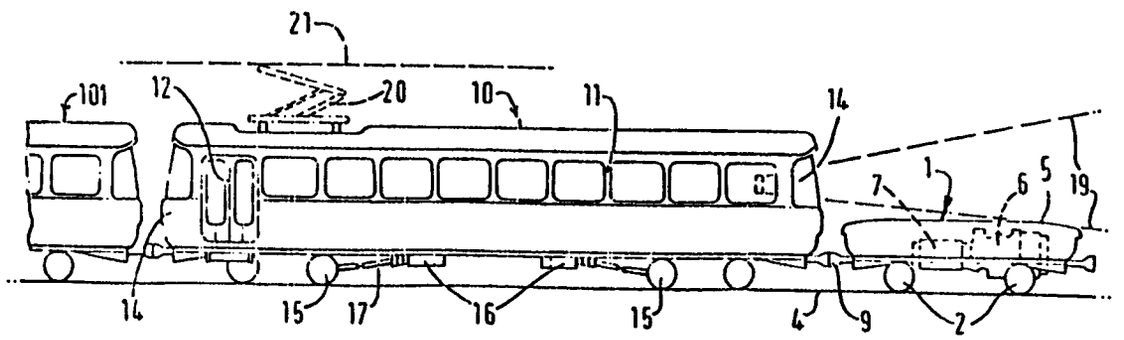
(54) Railway vehicle.

(57) A railway train which may be of the railbus or railcar type comprises one or more load carrying vehicles (10) is coupled to a power unit vehicle (1) on which are mounted on electric generator (7), and an engine (6) for driving the generator. The vehicle (10) has an electric motor (16) for driving its rail wheels (15) when energized by the generator output, the power source unit rail wheels (2) being undriven. The vehicle (10) may have electric power collector means (20).



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RAILWAY VEHICLE

DESCRIPTION

The invention relates to a railway vehicle, to a train of such vehicles, and to a method of operating such a train.

The invention is particularly but not exclusively applicable to railbus and railcar vehicles or units, comprising in the simplest form a single passenger-carrying unit, and to short trains of two or more similar units. Such vehicle units and trains can be powered electrically where the track on which they are to run is provided with an electric third rail or overhead cable but more often the unit, or the propulsion unit of the train, is powered by diesel engine, normally mounted underfloor to save space. The present invention is concerned to provide arrangements which provide improvements over such rail vehicles in a variety of ways.

The invention accordingly provides a rail vehicle of which the rail wheels are undriven, the vehicle carrying a generator for providing an electric power output and an engine for driving the generator. Such a power source unit can be coupled, preferably releasably, to a second, load carrying, rail unit having rail wheels driven by an electric motor so that the generator output is supplied to the electric motor and the power source unit is towed or pushed by the second unit.

The invention also provides a railway train comprising a plurality of units of which one preferably separate unit carries means adapted to generate electrical power for energising an electric propulsion motor carried by the other, or another, unit.

Further, the invention provides a method of operating a railway train comprising coupling together a first rail vehicle having rail wheels and an electric

motor arranged to drive the wheels and a second rail vehicle having rail wheels and means for generating electric power to energize the motor, and moving the train along a track by driving wheels of the first vehicle only.

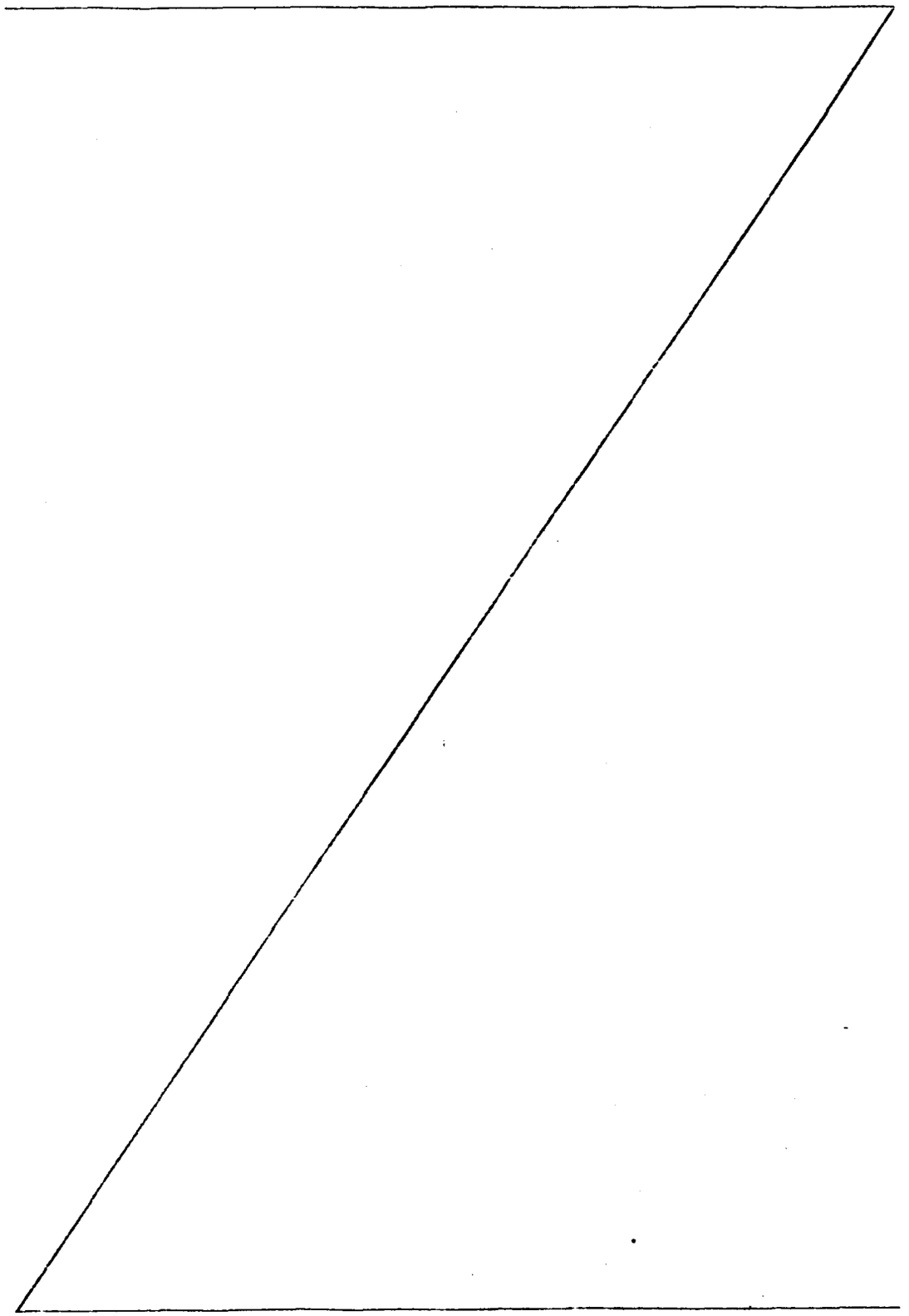
The invention provides numerous advantages over existing arrangements. Thus, when the power source unit is employed with one or more passenger units, the comfort of passengers is improved because the passenger unit or units need incorporate no internal combustion engine, but only one of more electric motors. The noise and vibration of the diesel or other internal combustion engine is effectively restricted to the power source unit.

Moreover, the fuel for the engine can be carried in the power source unit and thus in a car or unit separate from the passenger units. The fire risk due to fuel-impregnated brake dust, which can ignite under heavy braking conditions, is thus reduced.

In addition, utilisation is improved. Normal utilization of a diesel powered passenger unit is around 85% whereas the comparable figure for an electric passenger unit is 95%. In accordance with the invention, the lower figure applies only to the power source unit, not to the more expensive passenger unit. Also, it is readily possible to provide the associated passenger unit or units with cable or third rail electrical pick-up means, so that they can be used alternatively as diesel units, in association with a power source unit of the invention, or as electric units either on their own or with the power source unit coupled thereto but inoperative.

Finally, the engine of a power source unit embodying the invention can readily be made much more accessible than an engine mounted beneath the floor of the passenger unit, so that routine maintenance can be carried out easily, and not stinted or omitted.

The invention is further explained below, by way of illustration, with reference to the accompanying



drawing, the single figure of which is a schematic side view of a train of rail vehicles including a power source unit in accordance with the invention.

Shown at the right of the figure is a power source vehicle or unit 1 comprising a frame journalling two pairs of rail wheels 2 by which the unit can roll on a conventional rail track 4. The frame carries within a suitable enclosure 5, a diesel engine 6 which drives a generator 7 and a fuel supply for the engine.

The power source unit 1 is coupled mechanically and electrically by a coupling assembly 9 to a passenger unit 10 having a chassis carrying a superstructure 11 providing passenger accommodation, with access doors 12 and a suitably equipped driver's cabin 14 at each end. Mounted beneath the chassis by suitable suspensions are two pairs of rail wheels 15, each pair of wheels being driven by a respective electric motor 16 mounted beneath the chassis. The drive from each motor 16 is taken to the shaft on which the associated pair of wheels 15 is carried by drive shaft arrangements 17 incorporating couplings to accommodate wheel movement relative to the chassis.

The passenger unit 10 contains no source of the electrical power needed to drive the electric motors 16. This power is obtained from the power source unit 1 under control of a driver in one or other of the cabins 14. The power source unit 1 will normally be trailed but it can be pushed and it will be noted that it can be of low construction, so that the range of vision of the driver, indicated by the lines 19, is not restricted.

The power source and passenger units 1 and 10 are thus together capable of travel on the track 4 without an external power supply. Nevertheless, the passenger unit 10 can if desired be provided with pick-off means for obtaining electricity from an external source. Thus the passenger unit 10 has a collector mounted above

its roof by a pantograph device 20 for electrical connection to an overhead line 21, and it could incorporate collector for engagement with an electrically live third rail instead or as well. The passenger unit 10 is thus capable of use as an electric unit on its own or as either an electric unit or, as a diesel powered unit, in association with the unit 1. The units 1 and 10 can conveniently be associated for operation on a track which is only partially electrified, the diesel power unit being then employed only when required, on non-electrified portions of the track.

In place of the unit 10, there can be used any other kind of passenger or other load carrying unit in which propulsion is effected by one or more electric motors. Instead of the railbus type of unit shown, a rail car type unit, supported by two bogies each with a pair of wheels 22 in addition to the wheels 15 as shown in broken line, could be coupled with the power source unit 1. Also, the power source unit 1 can be coupled to at least one other unit 101, as indicated to the left of the figure, which unit may or may not include electric propulsion means.

It will be appreciated that the invention can be embodied in a variety of ways other than as specifically described. For example, the power source unit could have a superstructure corresponding in cross-section to that of the other unit of the system and be located between two such units, with a corridor through it for passenger communication.

CLAIMS

1. A rail vehicle (1) supporting a generator (7) for providing an electric power output, and an engine (6) for driving the generator, the vehicle rail wheels (2) being undriven.

2. A rail vehicle as claimed in claim 1 supporting a fuel supply for the engine.

3. A rail vehicle as claimed in claim 1 or 2 wherein the engine (6) is a diesel engine.

4. A railway train comprising a rail vehicle as claimed in claim 1, 2 or 3 releasably coupled to at least one load-bearing rail vehicle (10) having at least one electric motor (16) and rail wheels (15) drivable by the at least one electric motor (16) on energization thereof by the electric power output.

5. A railway train comprising at least one load-bearing vehicle (10) releasably coupled to a power source vehicle (1), the load-bearing vehicle (10) carrying at least one electric motor (16) arranged to drive rail wheels (15) of the load-bearing vehicle, and the power source vehicle (1) supporting means (6,7) for energizing the electric motor (16).

6. A railway train as claimed in claim 4 or 5 wherein the load-bearing vehicle has means (20) for receiving electric power from a third rail and/or an overhead line (21).

7. A railway train as claimed in claim 4, 5 or 6 wherein the load-bearing vehicle (10) has a driver's cabin (14) at the end thereof adjacent the power source vehicle, the power source vehicle (1) being of a shape such as not to obstruct the view of a driver in the driver's cabin (14).

8. A railway train as claimed in claim 4, 5 or 6 wherein the power source vehicle has a transverse profile at least approximately corresponding to that of the load-bearing vehicle (10).

9. A railway train as claimed in claim 4, 5, 6, 7 or 8 wherein the load-bearing vehicle (10) is a railcar, railbus or other passenger carrying vehicle.

10. A method of operating a railway train comprising coupling together a first rail vehicle (10) having rail wheels (15) and an electric motor (16) arranged to drive the wheels and a second rail vehicle (1) having rail wheels (2) and means (6,7) for generating electric power to energize the motor (16), and moving the train along a track (4) by driving the wheels (15) of the first vehicle (10) only.

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