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Anticlimber for Railroad Vehicles

CROSS-REFERENCE TO RELATED PATENT APPLICATION

5 This application is a National Phase Patent Application of International Application Number PCT/AT05/000255, filed on July 7, 2005, which claims priority of Austrian Utility Model Number A 1289/2004, filed on July 28, 2004.

BACKGROUND OF THE INVENTION

10 1. Field of the Invention

The invention relates to a rail vehicle equipped with an anticlimber disposed at one end of the vehicle and extending over substantially the entire width of the vehicle.

2. Description of Related Art

15 In the event of a collision between two rail vehicles, there is the risk of one vehicle body being pushed up over the other with a certain degree of vertical misalignment, by which means considerable damage to the passenger compartment will be caused. To prevent this, it has been usual in recent years to provide the end regions of vehicles with so-called anticlimbers.

20 An anticlimber of the type mentioned above, has been disclosed in US 4,184,434 A , for example.

Usually, anticlimbers possess several parallel and horizontal fins, as may be seen, for example, from the drawings shown in Figs.1 to 3 of the prior art. In the case of the partially shown railroad carriage 1, an anticlimber 2 is disposed at both ends thereof and extends over substantially the entire side of the carriage such that in the event of a collision force can be
25 diverted into the chassis region of the carriage. In the vicinity of the coupling 3, the anticlimber 2 becomes narrower or is interrupted. The anticlimber 2 projects beyond the end wall of the carriage, as shown in Figs.1 to 3. It might possess a cover, for example of fiberglass-reinforced plastics material, which in the event of a collision will be destroyed before mutual engagement of two anticlimbers takes place.

30 Known anticlimbers almost always compete with the coupling for space, for if the level of the coupling and that of the base of the carriage are fixed, there usually remains little space for an anticlimber when taking into consideration the movements of the coupling. This is shown, for example, in the article "Herstellung von Schienenfahrzeugen" ("Production of

Rail Vehicles“) in ZEV + DET Glas. Ann. 123 (1999). The space left for the anticlimber is in many cases too small for the installation of a continuous anticlimber.

The problem involved must be regarded as being that the total space occupied by the anticlimber is limited, as mentioned above, on account of the coupling, but it cannot be assumed, on the other hand, that when an accident occurs, the anticlimbers of two colliding carriages will be at exactly the same level.

This problem leads either to complete failure of the anticlimber or to some undefined force absorption taking place while at least partially by-passing the shock absorber system that is usually installed in railroad carriages.

It is therefore an object of the invention to provide a rail vehicle in which the aforementioned drawbacks are overcome as far as possible.

SUMMARY OF THE INVENTION

According to the invention, this object is achieved with a rail vehicle of the type mentioned above in that in the end region of the rail vehicle at least one anticlimber element is located which forms a partial extension of the anticlimber in a vertical direction and which is capable of engaging the anticlimber of the other rail vehicle in the event of a collision.

It is a merit of the invention that the force diversion occurring when two rail vehicles collide takes place, on account of the anticlimber element, at a higher level of engagement and is thus accurately measurable. Furthermore, it is of advantage that the space above the coupling remains substantially unused. Thus, thanks to the solution proposed by the invention, more space is available for the coupling together with the compressed air attachments and electrical components.

In a preferred embodiment of the invention, the at least one anticlimber element has fins which, in the event of a collision with another rail vehicle, is capable of engaging the fins of an anticlimber on the other rail vehicle.

Advantageously, at least one impact pillar is provided, whose longitudinal axis is substantially normal to the plane of the rails, the anticlimber element being disposed in the interior of the impact pillar.

Furthermore, the at least one impact pillar can be in the form of a thin-walled aluminum hollow profile, in which the at least one anticlimber element is disposed. The aluminum hollow profile can be dented when a collision occurs, which makes it possible for the anticlimber to engage the depressions in the anticlimber element.

Since the solution of the invention provides, depending on its design, sufficient space for an emergency exit, an advantageous variant of the invention consists in that the at least one impact pillar is in the form of a door pillar of an emergency exit.

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BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, is explained in greater detail below with reference to some non-restricting exemplary embodiments illustrated in the drawings, in which:

- 10 Fig. 1 is a side view of a conventional rail vehicle;
Fig. 2 is a rear view of a conventional rail vehicle;
Fig. 3 is a top view of a conventional rail vehicle;
Fig. 4 is a side view of the end regions of two colliding rail vehicles of the invention;
Fig. 5 illustrates the end regions of two coupled rail vehicles of the invention in a
15 normal operation position;
Fig. 6 shows the end regions illustrated in Fig. 5 in the event of a collision occurring with slight vertical misalignment of the participating rail vehicles;
Fig. 7 shows the end regions illustrated in Figs. 5 and 6 in the event of a collision occurring with a large vertical misalignment of the participating rail vehicles; and
20 Fig. 8 is a perspective view of a front side of a rail vehicle of the invention.

DETAILED DESCRIPTION

According to Fig. 4, a rail vehicle of the invention SCH, SCH', which is preferably a railroad carriage, has anticlimbers AKS, AKS' at its ends END, END', which extend
25 substantially over the entire width of the vehicle. In a preferred variant of the invention the rail vehicles SCH, SCH' are coupled to form a train rake.

The anticlimber AKS, AKS' has, in the embodiment illustrated, fins RIP, RIP' (Fig. 5). These fins RIP, RIP' extend horizontally and parallel to each other (Fig. 8). In this case there are three such fins RIP, RIP', and they can have a thickness of, say, 10 mm. The
30 anticlimber AKS, AKS' consists of a steel or aluminum alloy or some other material commonly used for rail vehicles. In the event of a collision of the rail vehicles SCH, SCH' taking place with slight vertical misalignment of the rail vehicles SCH, SCH' relative to each other the anticlimbers AKS, AKS' can interlock and thus prevent climbing (Fig. 6).

In order to prevent climbing when there is a collision with a large vertical misalignment of the two rail vehicles SCH, SCH' relative to each other, there is provided an anticlimber element AAE, AAE' above the anticlimber AKS, AKS', which anticlimber element forms a partial vertical extension of the anticlimber AKS, AKS'.

5 The anticlimber elements AAE, AAE' are capable of engaging the anticlimber AKS, AKS' of another rail vehicle in the event of a collision. In the embodiment illustrated here two block shaped anticlimber elements AAE, AAE' are provided above each anticlimber AKS, AKS'.

10 The anticlimber elements AAE, AAE' represent a functional extension of the anticlimber AKS, AKS'. The anticlimber element AAE, AAE' which can be of the same material as the anticlimber AKS, AKS', likewise has fins RIP'', RIP'''. The anticlimber element AAE, AAE' of a rail vehicle SCH, SCH' is set back from the anticlimber AKS, AKS' toward the vehicle body of said rail vehicle SCH, SCH' in the longitudinal direction of the vehicle.

15 According to Fig. 7, the fins of the anticlimber element AAE can, in the event of a collision, engage the fins of an anticlimber AKS' of another rail vehicle SCH', by which means, according to the invention, climbing of the rail vehicle SCH' onto the rail vehicle SCH can be prevented.

20 The anticlimber element AAE, AAE' can be joined to the anticlimber AKS, AKS', for example, by welding, or alternatively it can be produced as a single unit with the anticlimber AKS, AKS'. The anticlimber element AAE, AAE' can, if appropriate, be produced as an independent structural element attached to an underframe UGS of the rail vehicle SCH.

25 In a preferred embodiment of the invention, the anticlimber element AAE is disposed in the interior of an impact pillar APS, APS', whose longitudinal axis L is substantially normal to the plane of the rails (Fig. 8). The impact pillar APS can be in the form of a thin-walled aluminum hollow profile, in which the anticlimber element AAE is disposed. In the event of a collision, the aluminum hollow profile can be dented with the result that the anticlimber AKS' can engage the anticlimber element AAE.

30 In order to assure good engagement of the anticlimber AKS, AKS' over the entire width of the vehicle SCH, SCH', preferably at least two anticlimber elements AAE, AAE' or impact pillars APS, APS' are provided at the front of the vehicle SCH, SCH'.

 According to one embodiment of the invention, the impact pillars APS form pillars of an emergency exit disposed at the front of the vehicle (Fig. 8). This embodiment is, in

particular, made possible by the fact that the space required for an emergency exit is present, since the anticlimber element AAE does not restrict the space available at floor level.

To summarize, it may be stated that it is a great merit of the invention that it enables a continuous anticlimber to be provided in a simple and cheap manner without incurring space
5 conflicts with the coupling.