

E. MITTAG.
RAILWAY SYSTEM.
APPLICATION FILED JAN. 20, 1910.

968,384.

Patented Aug. 23, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

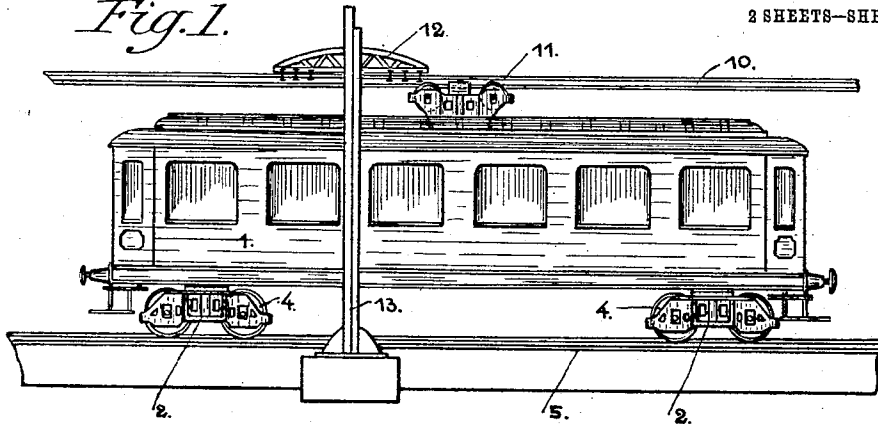


Fig. 2.

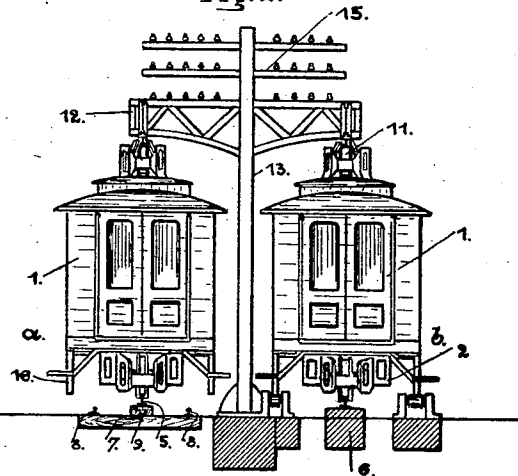
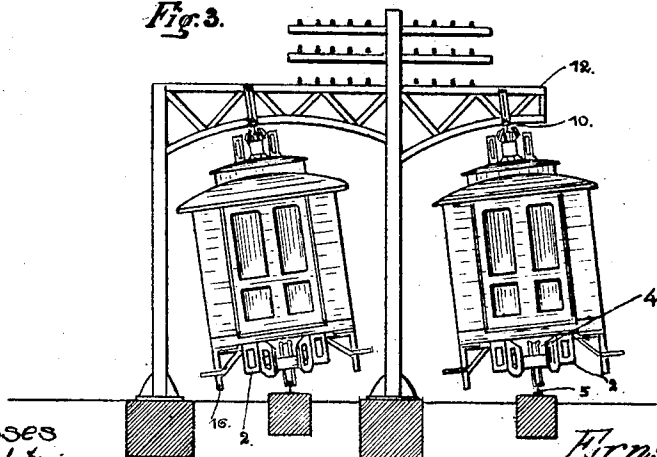


Fig. 3.



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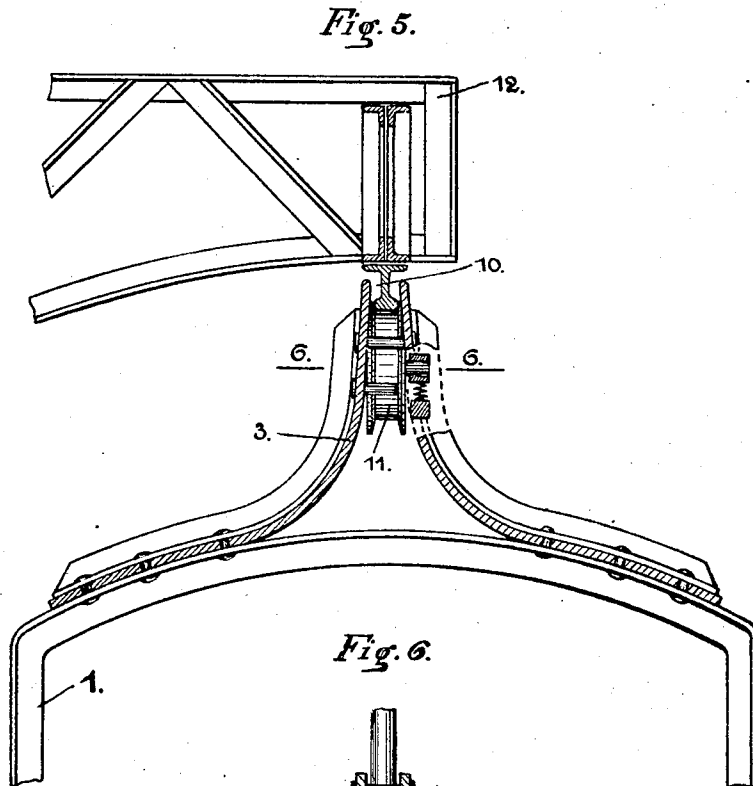
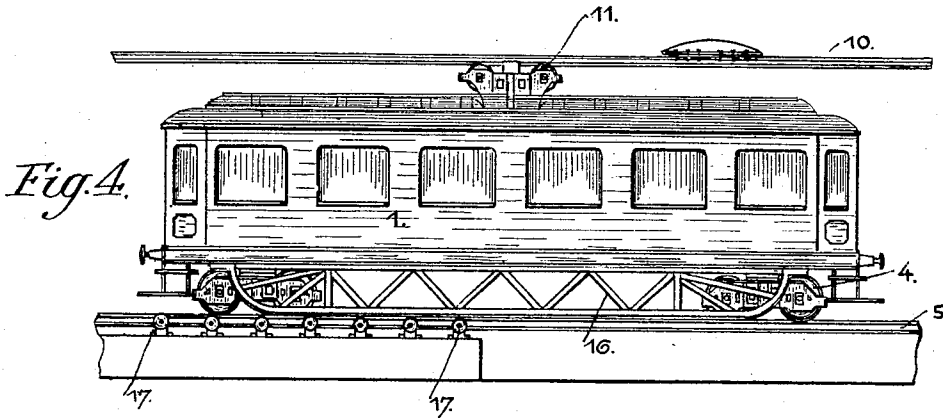
Ernst Mittag
By J. S. Senger

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2 SHEETS—SHEET 2.



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RAILWAY SYSTEM.

968,384.

Specification of Letters Patent. Patented Aug. 23, 1910.

Application filed January 20, 1910. Serial No. 539,162.

To all whom it may concern:

Be it known that I, ERNST MITTAG, a citizen of the German Empire, residing at Berlin, in the Kingdom of Prussia, in the German Empire, have invented certain new and useful Improvements in Railway Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in railway systems. And the object of the improvements is to provide a system in which the resistance of the train on the rails is small and in which simultaneously the danger of derailments is reduced to a minimum even in case of high speeds. For this purpose my improved system comprises a single rail located on the road bed, or another suitable support. By thus using a single main or lower rail the lateral oscillations of the vehicle are prevented, and at the same time its resistance is reduced to a minimum. Furthermore a guide rail is provided in a suitable position relatively to the vehicle which is preferably engaged by guide wheels or rollers mounted on the vehicle. In the preferred form the said guide rail is located above the train, so that it exerts only lateral pressure on the vehicle, if the latter has the tendency to lose balance. On account of this construction, the resistance offered by the said guide rail is exceedingly small.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings, in which the same letters of reference have been used in all the views to indicate corresponding parts.

In said drawings,—Figure 1, is a side view of the system comprising a single lower rail, and a guide rail above the car, and the car which is provided with lower wheels and upper guide wheels, Fig. 2, is an end view of Fig. 1 showing a railway having two tracks, the roadbed of the tracks being constructed in different ways, Fig. 3, is a similar end view showing the arrangement of the guide rails in curves, Fig. 4, is a side view of a modification of the railway car shown in Fig. 1, Fig. 5, is a detail view showing the construction of the upper guide rail and of the upper guide roller cooperating therewith, and in addition thereto means for preventing a derailment of the

upper guide roller, and Fig. 6, is a section taken on the line 6—6 of Fig. 5.

Referring to the example illustrated in the drawings, the body 1 of the car is supported on two trucks 2, 2, and the said trucks are each provided with two wheels 4 disposed centrally of the car and in line with each other. The said wheels are designed to run on a single rail 5 which is mounted on a foundation of concrete 6, as shown in the right hand part of Fig. 2, or on the usual sleepers 7 located on the road bed. In the latter case, the sleepers are connected with each other not only by the rail 5, but by one or more lateral ties 8, and where the single rail is arranged on an old road bed which before was used in a two rail system, the old rails are preferably used for providing a rigid connection between consecutive sleepers. In the preferred form the single rail 5 is not directly located on the sleepers, but on a longitudinal tie 9, as shown in Fig. 2. The function of the single rail is to take up the weight of the car and the lateral pressure.

To prevent the car from losing balance, a guide rail 10 is provided which in the example shown is located centrally above the car. The said upper rail provides a suitable guide for a pair of rollers or wheels 11 mounted in suitable bearings 3 on top of the car. The function of the said guide rails is merely to protect the car against tilting sidewise, while it does not take up the weight of the car. In the preferred form the upper guide rollers or wheels 11 are pressed against the guide rail by springs, so that they remain in constant engagement with the rail and yet can yield to vertical displacements of the car. Thereby a derailment of the car is prevented, even if the speed of the train be very high.

An arrangement of the guide rail relatively to the lower or main rail which is suitable in curves is shown in Fig. 3. As shown the upper rail is not located vertically above the guide rail, as is the case in a straight road, but the plane passing through the said rails is at an angle to the vertical plane passing through the lower rail. Thereby the car assumes an inclined position, so that a momentum is produced which counteracts the momentum caused by the centrifugal force. In the preferred form the rails are disposed at an angle to the vertical line a certain distance before the be-

ginning of the curve, so that the car has already its inclined position, when the curve begins. Thereby the lateral force exerted on the rails is reduced, because the momentum for turning the car in a direction opposite to the direction of the centrifugal force is exerted on the car, before the centrifugal force comes into action. In the example shown the upper or guide rail 10 is secured to a frame work 12 of iron structure, the poles 13 of which are disposed within distances of from 20 to 50 meters, and the said poles are supported on a foundation of concrete, or where the rails are located on an elevated railroad or on a bridge the said poles form a part of the iron structure of the bridge or elevated road. In case of electric cars, the upper or guide rail 10 is preferably constructed as a conductor for admitting the electric energy to the motor of the car. The iron structure supporting the upper rail is preferably provided with a suitable frame work 15 adapted to support telephone and telegraph wires.

In a system of the character described a derailment is almost impossible. However, in order to render the system even more reliable, the upper wheels or rollers are mounted in brackets 3 which with their upper ends extend sidewise of the guide rail, as is clearly shown in Figs. 5 and 6 of the drawings. In a similar way, the lower part of the car may be equipped at its sides with longitudinal guide bars 16 constructed in the form of the runners of a sledge. Should therefore a derailment occur, the wheels 4 of the car will not force themselves into the ground, but the whole car will be supported on the lateral runners 16 which by sliding on the ground will gradually annihilate the

kinetic energy of the train. At the stations I prefer to provide rollers 17 at the side of the main rail which provide additional supports for the cars, so that the cars are held at three points when at rest.

I claim:—

1. In a railway system, the combination with a vehicle, upper and lower single rails, supporting wheels for the vehicle running on the lower rail, flanged wheels on the top of said vehicle engaging the upper rail, and supports for said flanged wheels having extensions projecting abreast of and above said flanged wheels and on opposite sides of said upper rail.

2. In a railway system, the combination with a vehicle, upper and lower single rails, wheels above and below the vehicle for engaging said rails, and laterally disposed runners depending from said vehicles to substantial horizontal alinement with the bottoms of such lower wheels and normally out of engagement with the ground surface.

3. In a railway system, the combination with a vehicle, upper and lower single rails, wheels above and below said vehicle for engaging the rails, laterally disposed runners depending from said vehicles to substantial horizontal alinement with the bottoms of such lower wheels and normally out of engagement with the ground surface, and two oppositely disposed series of revolving supporting elements at stations for engagement with said runners, substantially as and for the purpose set forth.

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Witnesses:

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