No. 708,175. Patented Sept. 2, 1902.

W. SCHMITZ.

SUSPENDED RAILWAY VEHICLE.

(Application filed Nov. 5, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

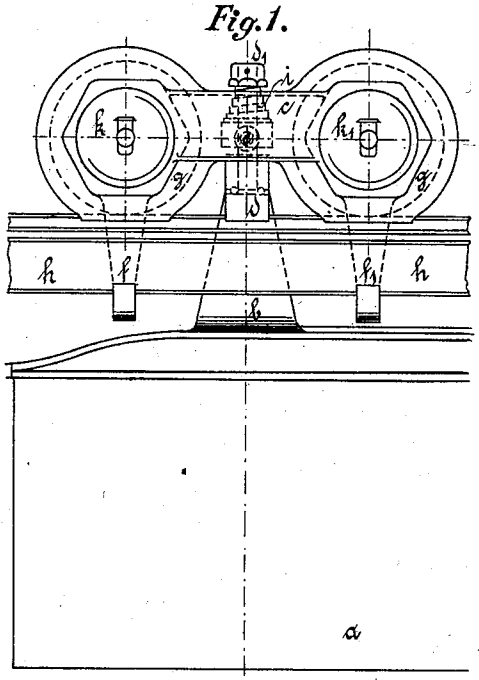


Fig. 2.

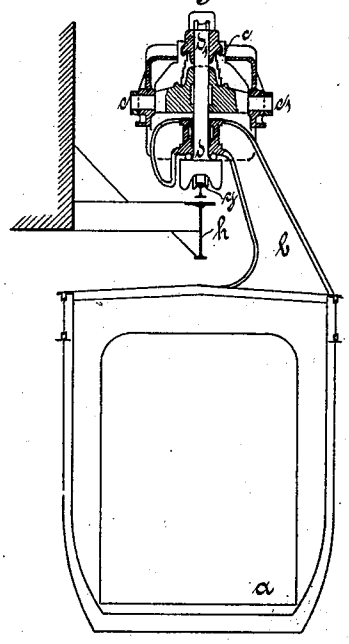


Fig. 4.

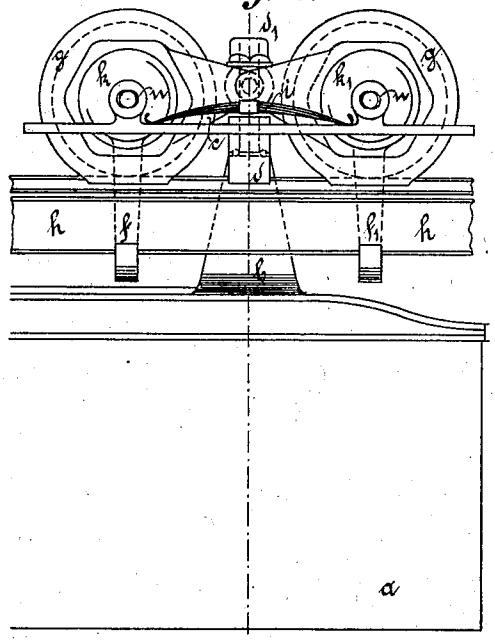
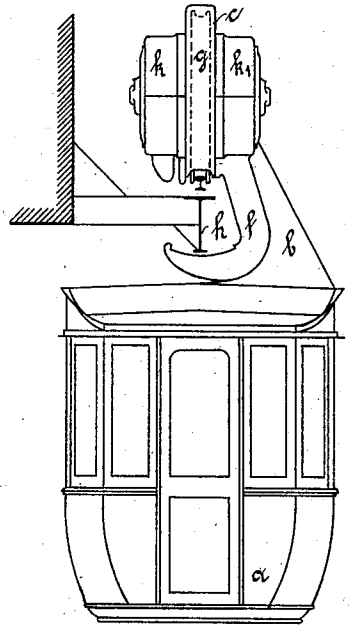


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

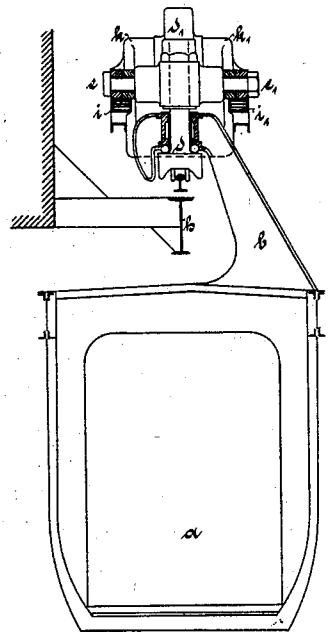


Fig. 6.

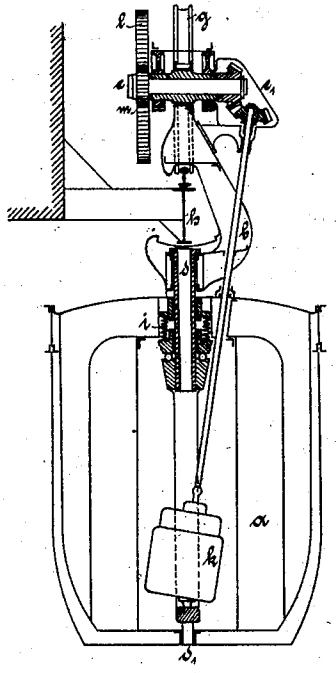


Fig. 7.

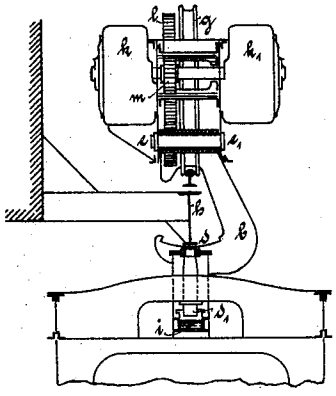


Fig. 8.

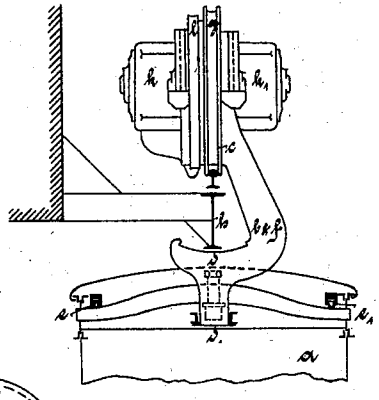
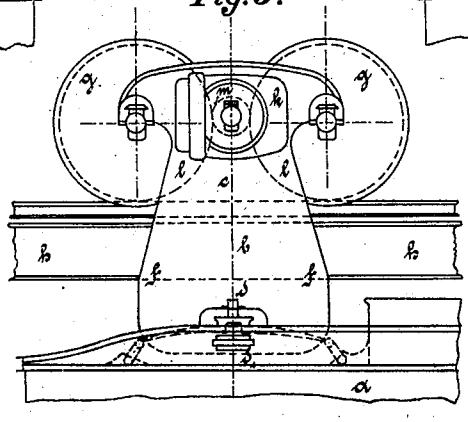


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILHELM SCHMITZ, OF ELBERFELD, GERMANY, ASSIGNOR TO THE CONTINENTALE GESELLSCHAFT FÜR ELEKTRISCHE UNTERNEHMUNGEN, OF NUREMBERG, GERMANY.

SUSPENDED RAILWAY-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 708,175, dated September 2, 1902.

Application filed November 5, 1901. Serial No. 81,228. (No model.)

To all whom it may concern:

Be it known that I, WILHELM SCHMITZ, mechanical engineer, a subject of the German Emperor, residing at Elberfeld, in the Kingdom of Prussia and the German Empire, have invented a new and useful Improvement in Suspended Railway-Vehicles, of which the following is a specification.

My invention relates to improvements in the construction of vehicles for monorail elevated railways of the type in which the vehicles are suspended from a single overhead rail.

It is the purpose of my invention to provide efficient means in the arrangement of said vehicles whereby a smooth traversing of curves, changes of gradient, and irregularities of the track are secured, so as to avoid shocks and oscillations.

In order to prevent longitudinal oscillations of the vehicle-body caused by horizontal and vertical movements of the truck-wheels when traversing curves, changes of gradient, and irregularities of track, the connection (connecting-links) between the vehicle-box and the trucks is placed so as to be little affected by said movements.

In order to prevent derailment, a safety-catch is provided embracing the rail-carrier with but little free play, said catch being conveniently arranged vertically below the truck-wheels. The areas of trucks and car-boxes which are exposed to head winds must be balanced independently, so as to prevent any tendency of these parts being turned about a vertical axis. At the same time care should be taken to so arrange the masses of the car-box and the trucks that their lines of gravity pass through the center of the rail-head.

The invention consists to these ends in novel features of construction and in the parts and new combinations of parts hereinafter fully described, and then particularly pointed out in the claims which follow this specification.

With reference to the annexed drawings, Figure 1 is a side elevation, Fig. 2 a cross-section, Fig. 3 an end elevation, of a vehicle constructed according to this invention. Fig. 4 is a side elevation, and Fig. 5 a cross-section, of a modified form of vehicle. Fig. 6 shows another modification of the car; and Figs. 7, 8, and 9 represent a mode of suspension of the car in cross-section, end view, and side elevation.

Referring to Figs. 1, 2, and 3 of the drawings, *a* is the vehicle-box, connected by means of two hangers *b* to the trucks *c*. The connection between the hangers *b* and the trucks *c* is arranged above the rails supported by carriers *h* and consists conveniently of a universal joint composed of a vertical axis *d d'* to enable the truck *c* to follow curves in a horizontal sense and of a horizontal axis *e e'* to enable the truck to follow curves in a vertical sense, (changes of gradient.) The arrangement and form of the hangers *b* should be so that in the case of the connection between the car-body and the trucks being broken the hangers are caught by the rails, thus preventing any accident to the vehicle.

The safety-catches *f f'*, rigidly connected to the truck-frames *c*, embrace the rail-carriers *h* vertically below the truck-wheels *g* with but little free play in order to prevent the latter from any material rise which should cause a derailment of the vehicle. For vehicles as described in Langen's patent, No. 550,513, the safety-catches are conveniently curved according to the arc of a circle having its center with the rail-head in common. Spiral springs *i* are inserted between the hangers of the car-body *a* and the trucks *c*. The motive power is usually derived from electric motors *k k'*, directly coupled to the wheels *g*. This arrangement I preferably employ in motor cars and locomotives, but it may be modified as circumstances require. The kind of motor and the mode of arranging the same are not essential to my invention, but care should be taken that in all cases the momenta of forces as regards masses and wind resistance are balanced.

In Figs. 4 and 5 a modification of the car construction is shown, wherein the trucks *c* are not made of rigid side frames, as in Fig. 1, but in two halves connected by means of the pin *e e'* and supported by the springs *i i'*.

The lower ends of the safety-catches *f f'* are similarly curved, as in Fig. 3. The upper parts, however, are rigidly connected to a

flat bar-frame. The latter is suspended from the axle-boxes n of the truck-frames in such a way as to allow a little horizontal play of the former, this play being required for the truck-axles n while moving horizontally under the influence of the vertical play of the springs $i\,i'$. The motors $k\,k'$ may be arranged as in the foregoing example shown in Figs. 1–3. The balancing of the momenta of forces is likewise effected according to the principles as explained before.

Figs. 6 and 7 show a modification of the vehicle with a vertical axis $d\,d'$ forming a king-post beneath the rail-carrier h and passing through the vehicle-body. The middle part thereof is preferably bifurcated to receive the motor k and the lower part ends in a toe turning in a step-bearing. The gearing between the motor k and the traveling wheels is indicated by the letters $e\,m\,l$.

Figs. 8 and 9 show a modification of the foregoing, wherein the vertical axis $d\,d'$ and the horizontal axis $e\,e'$ of the universal joint are arranged below the rail-carrier h. In this case the trucks, the safety-catches, and the hangers are forming one rigid frame.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In monorail elevated railways with suspended vehicles a connection between the wheel-trucks and the vehicle-box consisting of a universal joint above the rails composed of a vertical axis and a horizontal axis parallel to the truck-wheel axles in combination with an arrangement of the masses and the area exposed to air resistance, of the trucks and the vehicle-box so as to have their lines of gravity passing through the center of the rail-head, as and for the purpose set forth.

2. In monorail elevated railways with suspended vehicles a connection between the wheel-trucks and the vehicle-box consisting of a universal joint above the rails composed of a vertical axis and a horizontal axis parallel to the truck-wheel axles in combination with an arrangement of the masses and the area exposed to air resistance, of the trucks and the vehicle-box so as to have their lines of gravity passing through the center of the rail-head, and a safety-catch connected to the truck-frame, embracing the rail-carrier, as and for the purpose set forth.

3. In monorail elevated railways a vehicle provided with universal-joint connections for supporting said vehicle at two or more points above the rail, the arrangement being such that the vehicle will adapt itself for variable curves and gradients, substantially as described.

4. In monorail elevated railways a vehicle provided with universal-joint connections for supporting said vehicle at two or more points above the rail; in combination with one or more safety-catches located below the rail-support, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILHELM SCHMITZ.

Witnesses:
ALOIS GOBANZ,
ALBERT BESOLD.