Jan. 14, 1941. K. WIESINGER 2,228,800

HIGH SPEED RAILWAY

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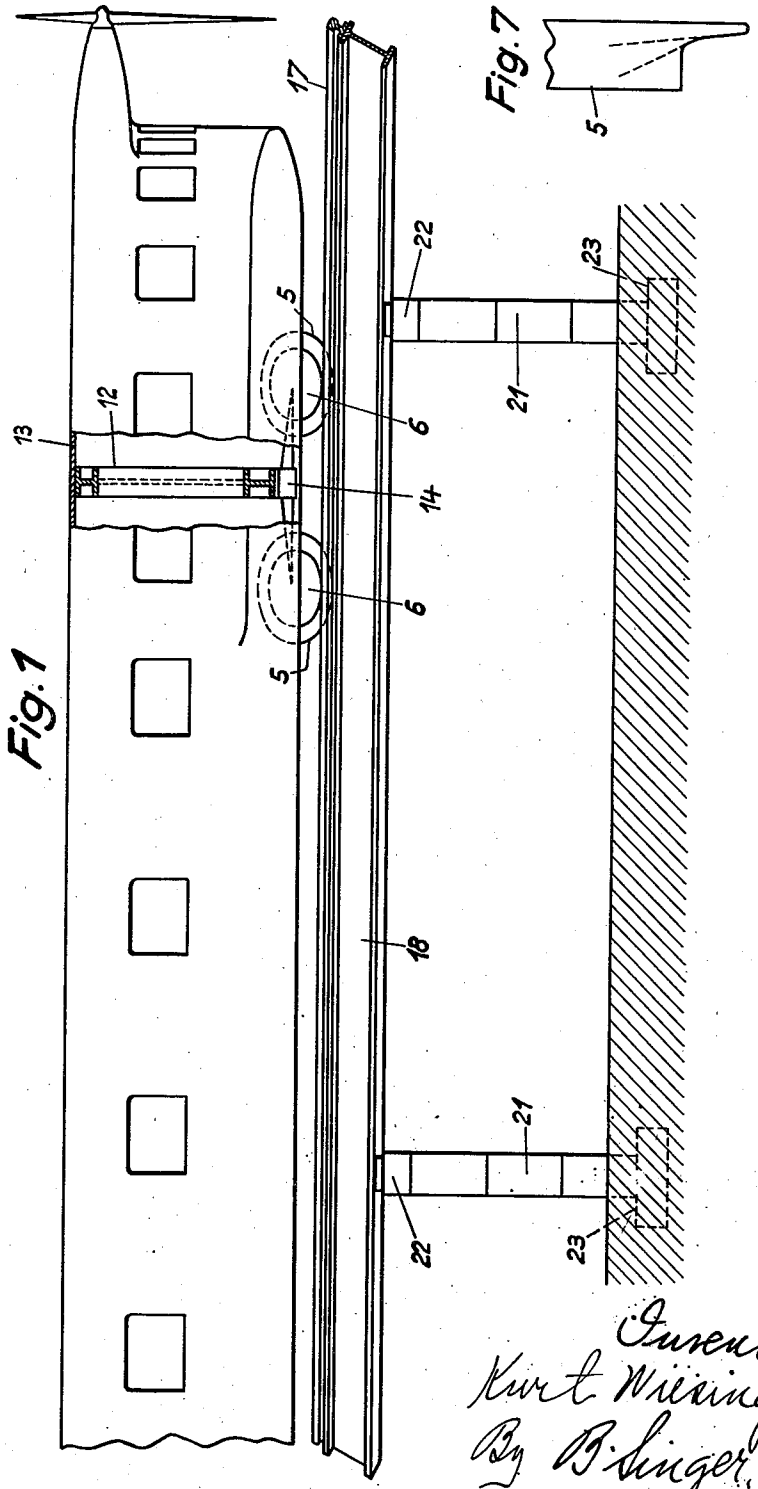


Fig. 1

Fig. 7

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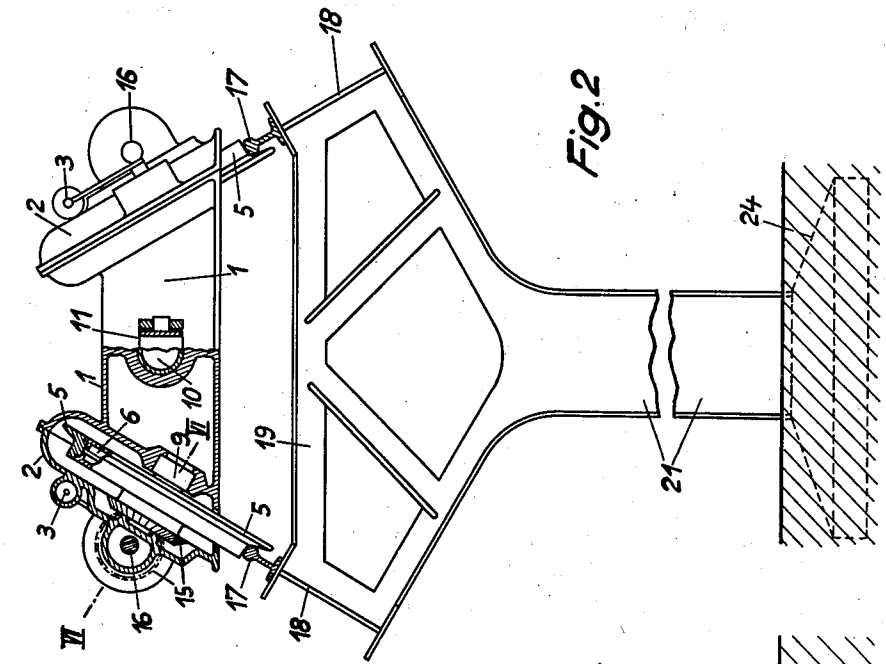


Fig. 2

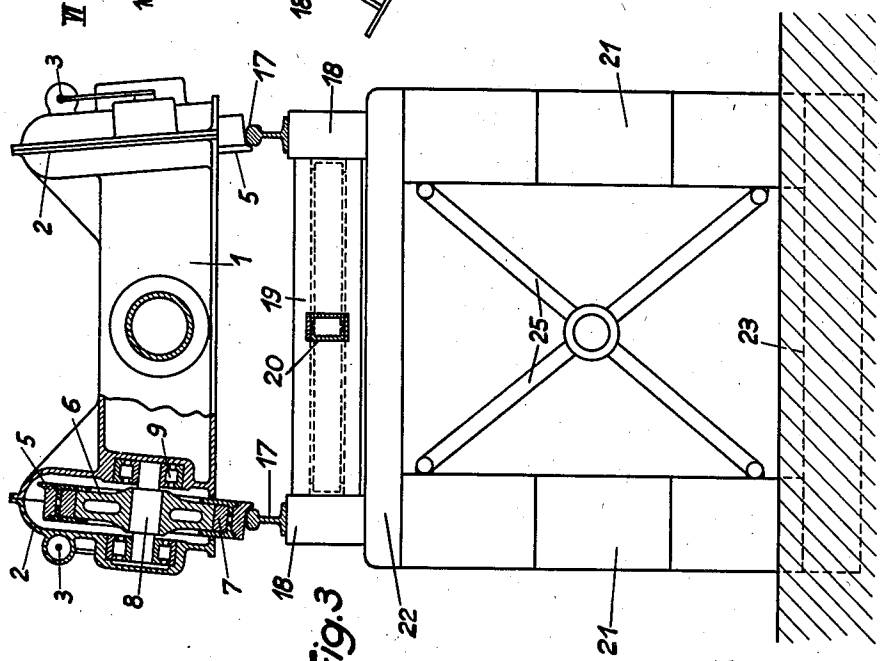


Fig. 3

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Fig. 4

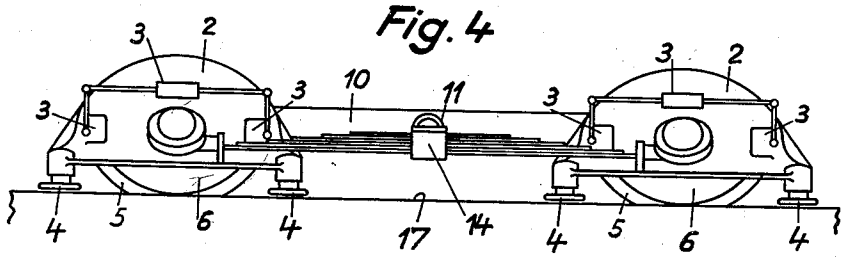


Fig. 5

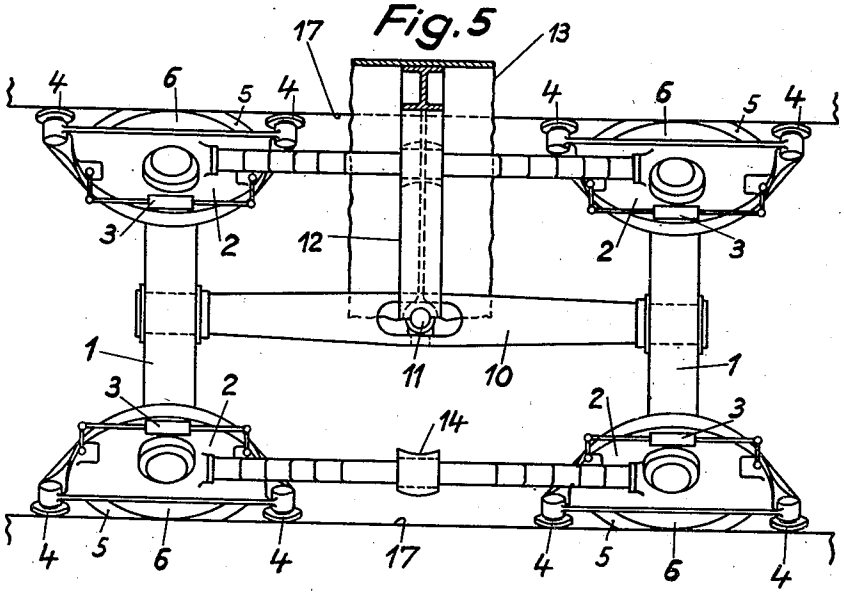
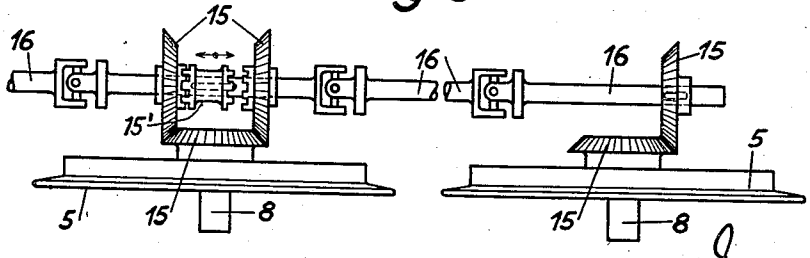


Fig. 6



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UNITED STATES PATENT OFFICE

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HIGH SPEED RAILWAY

Kurt Wiesinger, Zurich, Switzerland

Application August 10, 1938, Serial No. 224,166
In Germany December 15, 1937

4 Claims. (Cl. 105—157)

The present invention relates to an improvement in a railway.

The railway according to my invention, is free from rolling and has the minimum resistance to travelling even at the highest speeds, as also a particularly low straining of the material. When it is also rendered secure against derailing according to my United States Patent No. 1,529,101, it enables ultra-light vehicles to be used for which even in the case of long distances an elevated or at least a semi-elevated railway does not become more expensive than the present day railways running on the ground.

An elevated railway of this type which is secure against derailing, possesses, especially for high speed travelling, the great advantage that the land no longer has to be broken up, that the costs of acquiring land become less, that level crossings as also the danger of snowing up and collisions with grade crossing vehicles are eliminated and that in addition a somewhat smaller air resistance occurs. The ultra-light vehicles are provided with light metal bodies, so that an elevated railway of this character is only about half as expensive, by reason of the very low axle pressures, as a fast train section of the usual construction and the speed of travel becomes much higher in spite of the small work in propelling the train.

In this manner there is obtained the economy of high speed travel by the improvement of the co-operation of the running mechanism, wheels, rails and supporting structure of the track.

Two examples of construction of the subjects of the invention are illustrated in Figs. 1 to 7 of the accompanying drawings.

Fig. 1 is a side elevation of a portion of a car embodying the invention.

Fig. 3 relates to a construction without a security against derailing, whilst the remaining figures relate to a construction provided with a device for this purpose. In the first three figures there is shown an elevated railway, with which the invention is primarily concerned, and this type of railway may be fitted either with two or with one track-supporting posts 21. Fig. 2 relates to a driving pivoted bogie, whilst Fig. 3 shows a running axle. Figs. 4 and 5 show in elevation and plan a bogie fitted with wheel and rail brakes, whilst Fig. 6 shows a section on line VI—VI of Fig. 2 of a reversible gear for coupled wheels, and Fig. 7 a separate partial view of a wheel tire with a deep flange.

In the various figures, 1 indicates the axle housings with the covers 2 which, at the same time serve as bed plate for the wheel brakes 3 or for the rail brakes 4 or for both together. 5 indicates the wheel tires which are applied directly to the wheel bodies 6 (Fig. 2) or through the medium of a resilient cushion 7 (Fig. 3), whilst the wheel bodies themselves preferably consist of light metal, wood or a suitable artificial material. The wheels are preferably provided with stub axles 8 which are supported by the inner rings of the roller bearings 9, 10 indicates the central longitudinal truss for connecting together two axle housings for forming a bogie. (Fig. 5.) This truss 10 receives the pivoting sleeve 11 for the pivot which is not shown in the drawings. This pivot is lodged in a frame 12 and the weight of the cars (Figs. 1 and 5), which supports the body 13. Frame 12 is supported by a slide-plate resting on the leaf springs 14 at each side in such a way that the said slide-plates and the pivot lie in one and the same transverse vertical plane. In the case of driving bogies 15 indicates the driving toothed wheels whilst 16 indicates the corresponding driving shafts, and 15' a clutch coupling to change the direction of travel. (Fig. 6.) 17 indicates the rails, 18 the longitudinal beams for the rails with the transverse beams 19 and the diagonal reinforcements 20. The supporting posts 21 are preferably held together by an upper yoke 22 and a lower yoke 23, whilst 24 indicates the foot of the central support, in the case where only one support is provided for. 25 indicates the stays between the supporting posts.

The method of operation of the invention will be seen from the drawings.

As cones do not roll along a straight line, the wheel tires 5 are provided with cylindrical running surfaces. The automatic centering of the wheels along the axis of the rails and their freedom from rolling is obtained by suitably inclining the wheel plane inwardly. For preventing derailment, deep flanges are provided which project below the heads of the rails and which are preferably more conical or spherical adjacent the rail-head engaging tread than beyond the same, see Fig. 7. In order to reduce the unsprung mass to a minimum there are used for the running mechanism very superior constructional materials such as special steels and light metals or suitable artificial products. It is also possible to place resilient cushions of rubber 7 or the like under the wheel rims. For facilitating replacement of worn tires there has also been developed a multi-part construction of the wheel bodies, which may consist of resilient or sound absorbing material such as ply wood or the like.

The axle housings on which there are fitted the

wheel brakes and the rail brakes are arranged at a small distance from the wheels. On the underside the axle housings are so shaped or lined that they fit closely to the streamline of the outer wall of the vehicle (see Fig. 1) so as to reduce the air resistance at these points to a minimum.

In the case of bogies with two axle housings the running mechanism is preferably provided with a central longitudinal truss, rotatably mounted in the axle housing, so that even in the case of spring movement of the rail vehicle the bearing points of the wheels remain as far as possible in the plane determined by the inclined stub axles. In addition the axis of rotation of the longitudinal truss is preferably so arranged that it is located in a plane centered between the rails when adjusting the position, in which plane there is preferably also located the centre of pressure of the pivot.

In the case of sets of driving axles there is preferred the separate wheel drive as this permits of an unconstrained negotiation of curves as the traction between the wheel and the rail replaces to a certain extent the differential gear. When the separate wheel drive is effected through longitudinal shafts and bevel wheels, these shafts may have the same direction of rotation for both directions of travel when the power transmission is constructed as reversing gear and only one or other bevel wheel is coupled to the driving shaft. This is particularly important when using internal combustion engines as it is then no longer necessary to construct these so as to be reversible.

For ultra-light vehicles the rails, as the supporting members of the running mechanism, have a strong inward inclination so as to prevent derailment. In this case it is possible to travel at particularly high speeds up to 500 km./h. and above with the high speed railway and this is preferably constructed as an elevated or at least semi-elevated railway. The supporting structure preferably consists of longitudinal trusses which have the same inward inclination of about 30° as the rails. In this manner there is obtained a particularly favourable power transmission for the supporting structure and a simple securing of the rails, whilst sleepers are omitted. The rails and carriers relatively reinforce one another and there is obtained a very efficient track with a minimum consumption of iron, reinforced concrete or the like.

Also for reasons of cheapness there are preferred open rolled profiles of iron for the supporting structure whilst for the supporting posts there is preferably used reinforced concrete. The yokes are standardized in the same way as the separate supporting posts of annular or other suitable cross-section so that these parts can be produced inexpensively on a large scale and need only be assembled at the point of erection. In this manner unevenness in the territory can easily be overcome by lengthening the supporting piles. By reason of recesses and hollow spaces these parts can be made as light as possible and convenient to handle. If necessary the hollow supporting posts may be filled with inexpensive waste material or thin concrete, whilst the entire installation can be strengthened by transverse and longitudinal stays.

A high speed railway of this character for at least 300 km./h. is not only inexpensive and economical, but can also be taken to the heart of large towns, the supporting structure being preferably mounted on central supports.

What I wish to claim and secure by U. S. Letters Patent is:

1. In a high speed railway, the combination with a vehicle body, a truck comprising axle housings, shafts mounted in said housings at the ends thereof, a wheel mounted on each shaft, said shafts being inclined upwardly-outwardly to effect inclination of said wheels upwardly-inwardly, a central longitudinal truss to which said housings are connected so as to be capable of turning about the central longitudinal axis of said truss, and load-carrying springs carried by said housings and normally supporting said body, said truss being constructed and connected with said body so as to support the body load in the event that the springs break.

2. In a high speed railway, the combination with a vehicle body, a truck comprising axle housings, shafts mounted in said housings at the ends thereof, a wheel mounted on each shaft, said shafts being inclined upwardly-outwardly to effect inclination of said wheels upwardly-inwardly, a central longitudinal truss to which said housings are connected so as to be capable of turning about the central longitudinal axis of said truss, and load-carrying springs carried by said housings and normally supporting said body, said truss being constructed and connected with said body so as to support the body load in the event that the springs break, the connection between said truss and said housings being such that the truss will hold said housings at predetermined distances apart.

3. In a high speed railway, the combination with a vehicle body, a truck comprising axle housings, shafts mounted in said housings at the ends thereof, a wheel mounted on each shaft, said shafts being inclined upwardly-outwardly to effect inclination of said wheels upwardly-inwardly, and a central longitudinal truss to which said housings are connected so as to be capable of turning about the central longitudinal axis of said truss, said truss having its ends projected through said housings.

4. In a high speed railway, the combination with a vehicle body, axle housings, shafts mounted in said housings at the ends thereof, a wheel mounted on each shaft, said shafts being inclined upwardly-outwardly to effect inclination of said wheels upwardly-inwardly, a central longitudinal truss by which a pair of said housings are connected together as a bogie so as to be capable of turning about a central longitudinal axis of said truss, a body member, a pivotal connection between said body member and said truss by virtue of which said truss is capable of rocking about a horizontal transverse axis passing through said connection.

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