Aug. 9, 1932. F. KRUCKENBERG ET AL 1,870,738

HIGH SPEED RAILWAY WITH PROPELLER DRIVEN STREAMLINE VEHICLES

Filed Sept. 6, 1929 2 Sheets-Sheet 1

Fig. 1

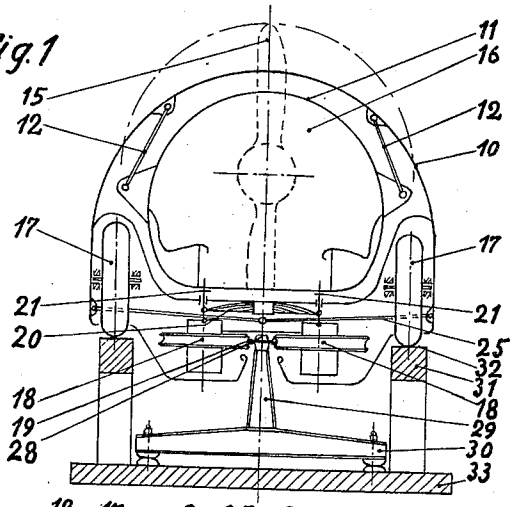
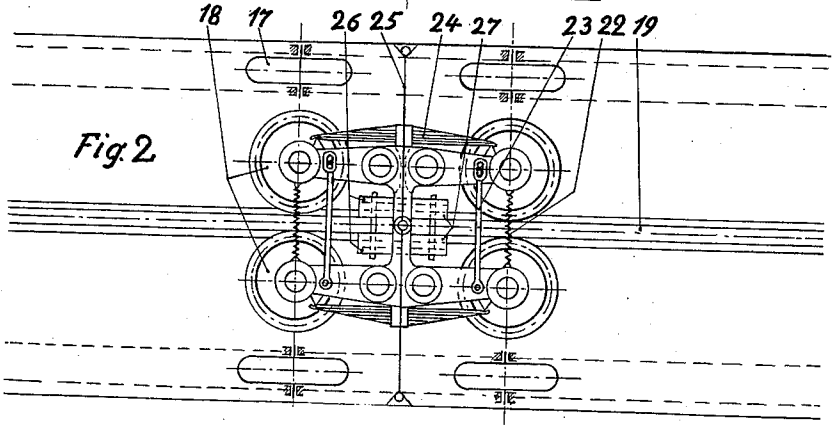


Fig. 2



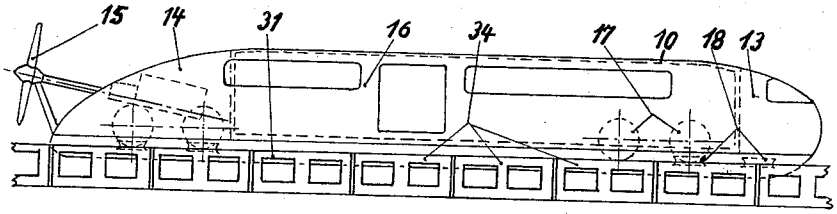


Fig. 3

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Filed Sept. 6, 1929 2 Sheets-Sheet 2

Fig. 4

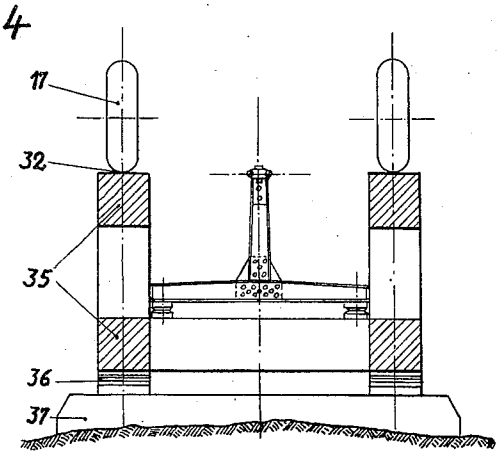


Fig. 5

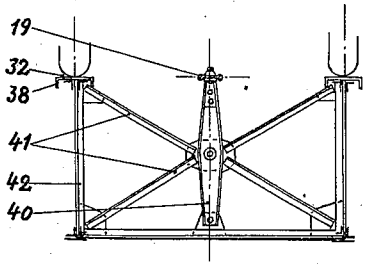
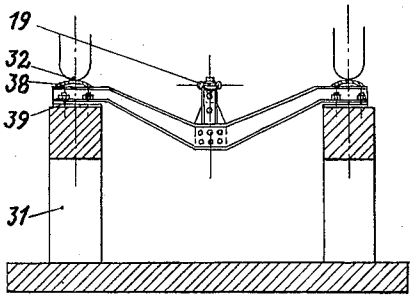


Fig. 6



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UNITED STATES PATENT OFFICE

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HIGH SPEED RAILWAY WITH PROPELLER DRIVEN STREAMLINE VEHICLES

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Various attempts have been made to increase the travelling speeds of vehicles running on the earth's surface, as for example railways and motor cars, over those usual at present. These attempts were not successful as to safety and economical operation. For on the one hand to make travelling with high speeds economical the weight and resistance of the vehicle running on a suitable track must be low, while on the other hand safety requires high weights with the above mentioned transport means. Railway vehicles with low weight and high speed do not hold the track reliably owing to their relatively hard tracks and want of resiliency between the rail and wheel rim and with lateral forces the wheels may even climb the rail which leads to certain derailment. With motor cars at high speeds low weight easily leads to danger of skidding. Moreover, safe operation of a very fast motor car is impossible in unfavourable atmospheric conditions.

The present invention provides a new standing railway for high speeds with a high degree of safety by combining the good properties of railways and automobiles. The functions of supporting and guiding the vehicle are fundamentally separated from each other. The new railway employs a propeller driven vehicle of the lightest possible construction which vehicle is of streamline form, and is carried by wheels with soft elastic tires running on an unyielding track, and the vehicle is guided laterally by hard guide wheels running on a rail laid as accurately as possible, laterally resiliently supported, and welded end to end over the entire length of the track. The guide wheels and the steel guide rail serve for starting and braking.

In the accompanying drawings, Figure 1 is a cross section, Figure 2 a plan and Figure 3 an elevation on a smaller scale, of the vehicle with the track. Figures 4, 5 and 6 are cross sections of other forms of rail supporting structure.

The outer body 10 of the vehicle comprises a spacious panelling or framework, which is enclosed by a light elastic skin. The vehicle has a streamline form adapted to its proximity to the earth's surface. Within the outer body 10 is an inner body 11 containing the passenger compartment 16 and constructed very much like a van with side walls and a floor and covered like an aeroplane frame. The covering of the inner body is of heat and sound insulating material. The inner body 11 is laterally sprung in relation to the outer body or suspended therefrom by pendulum bars 12. It may also be vertically sprung in relation thereto. The outer body 10 carries the driver's compartment 13, the engine and transmission gear 14 with the propeller 15, the carrying wheels 17, the guiding running gear 18 and the brake gear.

The carrying wheels 17 are large wheels, mounted independently in the outer body 10. They are provided with soft elastic tires or with pneumatic tires and can be pivoted directly to the outer body without the interposition of special springs. Naturally these wheels can be provided with small starting motors and brakes. The horizontal or nearly horizontal guide wheels 18 have hard rims. Each two guide wheels stand one opposite the other and run on the heads of a double headed rail 19. The guide wheels 18 can have two flanges; they are then vertically guided and must be resiliently supported relatively to the vehicle body 10, as by the aid of a spring 20. Abutments 21 are then provided to limit the spring movement, so as to avoid tipping over the vehicle. The guide wheels are advantageously used for braking and starting, since the particular location of the guide rail ensures the best condition of rail surface for braking and starting with least effect thereon by the weather, while the hard rims of the guide wheels enable the use of high pressure between guide wheels and guide rail necessary for obtaining high acceleration in starting and rapid retardation in braking. The guide wheels 18 are so held in relation to each other by springs 22 that upon the pressure of one wheel against the rail being decreased the opposite one is pressed more strongly against the rail. A limiting device 23 is provided so that at no time the wheels can lose engagement with the rail. The two guide wheels 18 are laterally sprung in common with a second spring

arrangement 24 with respect to the body 10 by, for example, a pivotally connected rod 25, so that the guiding forces and lateral shocks on the lateral guiding gear are reduced in transmission to the body 10. Naturally here also an abutment is provided which limits the extent of possible lateral movement of the lateral guiding gear with respect to the body 10.

The central guide rail enables an emergency rail brake to be provided. This consists of two brake shoes 26 which can grip the rail 19 from opposite sides. Advantageously this braking device is also sprung with respect to the vehicle body. Further, the emergency brake is so formed, that the shoe parts 27 lying opposite the rail head serve as an emergency support and catching device if a wheel should break.

The track consists of the central rail and two lateral supporting surfaces. It guides the vehicle accurately in the desired path and also provides as smooth as possible a support for the carrying wheels. For this purpose the laterally guiding rail 19 is laid as accurately as possible along the desired path and welded into a continuous length so that all blows which could endanger the rigidly-supported parts of the lateral guiding gear are avoided. Naturally, this lateral guiding rail has a certain elasticity; it is secured by plates 28 to the cantilever 29, which itself is secured to the track supporting structure 31 by adjustable bearers 30. The carrying wheels 17 are provided with highly elastic rims so that the running surfaces for them need not be absolutely continuous and smooth. In the illustrated example (Figures 1 and 4) the carrying wheels 17 run on concrete surfaces 32. These concrete surfaces 32 can be parts of concrete carrying members 31 which are mounted on base plates 33. The purpose of the carrying members 31 is to lift the running track a certain distance above the ground so as to avoid the influence of the ground surface—dirt and so forth—and of weather snow obstruction and so forth. The track supporting structure can consist of a series of short members 34 (Figure 3), which are made either on the spot, or made in a factory and then delivered and set up in position. Curves in the running surface at changes in slope need not be made if the members are only short enough. It is possible, however, to support the track in carriers 35 which can be mounted by adjustable supports 36 on separate foundations 37 (Fig. 4). Obviously instead of the concrete running surface 32, correspondingly shaped plank or rolled section tracks, for example wide rails or channel sections 38, Figures 5 and 6 can be used. It is then advantageous (Figure 6) to form the track members 32 and the lateral guiding rail 19 into a single structure and mount it adjustably at 39, on a carrying structure 31. Figure 5 shows the construction of the carrying structure in iron. This is particularly advantageous in undulating ground where the track may lie high above ground. The lateral guiding rail 19 is elastically sprung by a cantilever 40 with respect to the supporting structure 31, and the cantilever 40 can at the same time serve as a force transmitting member of the cross construction 41 between the main supports 42 of the structure.

We claim:

1. A high speed vehicle comprising a streamline outer body, supporting wheels, means mounting said wheels in spaced relation on and substantially entirely within said body, an inner body and means mounting said inner body within said outer body, the lower portion of said inner body depending into the space between said wheels.

2. A high speed vehicle comprising an outer body of streamline shape, an inner body disposed within said outer body and means movably mounting said inner body within said outer body.

3. The invention as set forth in claim 2, wherein said mounting means suspends said inner body from the upper portion of said outer body.

4. A high speed vehicle comprising an outer body having an operating compartment at its front end, a motor compartment at its rear end, an inner body comprising a passenger carrying compartment, and means mounting said inner body in the said outer body between said operating compartment and said motor compartment.

5. A high speed vehicle for operation on a pair of spaced supporting rails and a central guiding rail comprising, a body of streamline shape having a depending portion provided with a central, longitudinally extending slot, supporting wheels disposed substantially within said body, a pair of guiding wheels and means mounting said guiding wheels in the depending portion of said body one on each side of the slot.

6. A high speed vehicle comprising an outer body of streamline shape, an inner body disposed therein, and supporting wheels and guiding wheels carried on and disposed substantially entirely within said outer body.

7. A high speed vehicle for use with a supporting track and a guiding rail comprising a track, a pair of guiding wheels, means movably mounting said guiding wheels on said track for engagement with opposite sides of said guiding rail, and means resiliently urging said wheels into engagement with said guiding rail.

8. The invention as set forth in claim 7, wherein is provided means for limiting the movement of said guiding wheels away from said guiding rail.

9. A high speed vehicle for use with a sup-

porting track and a guiding rail comprising a track, a pair of brake shoes, and means mounting said brake shoes on said track for engagement with opposite sides of said guiding rail.

10. A high speed vehicle for use with a supporting track and a guiding rail, comprising a body, supporting gear and guiding wheels carried thereon, and braking means mounted on said body for engagement with said guiding rails and including a member extending laterally above the guiding rail, whereby in case of the breakage of said supporting gear, said braking means bears against said guiding rail to support said vehicle.

11. A track for a high speed vehicle comprising a pair of spaced parallel supporting rails, a guiding rail disposed midway between and parallel to said supporting rails and means including a vertical cantilever member for supporting said guiding rail.

12. A track for a high speed vehicle comprising a pair of spaced parallel supporting rails, a guiding rail disposed between and parallel to said supporting rails and means including an elastic upstanding cantilever member for supporting said guiding rail.

13. A track for a high speed vehicle comprising a frame having a pair of spaced parallel rails for supporting a vehicle, a guiding rail disposed between and parallel to said supporting rails and means resting upon said frame and including an upstanding cantilever member for supporting said guiding rail.

In testimony whereof, we affix our signatures.

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