PATENT SPECIFICATION

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Complete Accepted: Nov. 26, 1931.

COMPLETE SPECIFICATION.

Improved Driving Axle Arrangement for Endless Track Vehicles.

I, ADOLPHE KEGRESSE, of 156, rue Armand Silvestre, Courbevoie, France, a French Citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to driving axles for vehicles propelled by means of endless tracks in which there is an advantage in arranging the driving pulleys as close as possible to the ground, without, however, making a permanent contact therewith.

From the point of view of suspension, the driving axles of endless track vehicles heretofore belonged chiefly to two well defined types, viz:

1. Those wholly independent and bearing directly on the ground.

2. Those associated with the chassis to which they are either rigidly connected or suspended through a yielding or unyielding system.

As far as the type of driving axles associated with the chassis is concerned, the height of the axle above the ground varies with that of the frame, so that as the chassis comes closer to the ground, as a result, e.g. of a deflection of the suspension springs, the driving pulley will also come closer thereto, thus altering the angle of the endless band with the ground at the leading or trailing side thereof according to whether the driving axle is considered as arranged before or behind the set of rollers.

It has been found in practice that it is highly important that the driving axle should be maintained at constant height above the (flat) ground and very close thereto while allowing the same to rise when running over accidental obstacles.

If such result is to be obtained constantly, it is necessary that the connection of the axle with the remainder of the vehicle should be so provided as to allow the distance between the axle and the chassis to vary without materially influencing the position of the axle with respect to the ground.

The present invention comprises a driving axle arrangement for vehicles propelled by means of endless tracks wherein a connecting means is provided between the said driving axle and the carrying axle with the object of making the former completely independent of the movements of the chassis with respect to the ground.

Two constructions according to the invention are shown by way of example in the annexed drawings.

Figure 1 is a diagrammatic view in elevation of one of the combinations proposed.

Figure 2 is an elevational view of a further construction of the device.

Figure 3 is a plan view of Figure 2.

In all the figures, the carrying axle is indicated at 1 and the chassis at 2.

The carrying axle is connected to the chassis by a pair of springs 3 disposed longitudinally. Mounted in a known manner on the carrying axle is the main equalizer 4 of the carrying gear, which is provided at one end thereof with the loose pulley 5 and at the other end with a beam 6 connecting rollers 7 (Figures 1 and 2).

In the construction shown in Figure 1, the driving axle 8 is connected with the carrying axle 1 through a two-armed equalizer pivoted on the carrying axle 1, the longer arm 9 of the equalizer connecting the driving axle 8 with the carrying axle 1. The shorter arm 10 is arranged vertically above the carrying axle 1. The said arm 10 is adapted to slide vertically on a part 11 rigidly secured to the chassis 2 and on a further part 12 pressed by a spring 13 against the other face of the shorter arm 10.

The spring 13 bears at its other end against a member 14 rigidly secured to the chassis.

The positions of the parts 11 and 14 on the chassis are so arranged that the driving pulleys 15 carried on the driving axle 8 will remain at a certain height above the ground.

It will be seen readily that as the suspension spring 3 is deflected on any account, either by the effect of the load or by reason of oscillations resulting from the condition of the road, the position of the driving pulley 15 with respect to the

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ground will not change. In reality, the chassis 2 will come closer to the carrying axle as the springs 3 become deflected and the part 10 will slide between the parts 11 and 12 without materially affecting the longer arm 9 supporting the driving axle.

On the other hand, when the pulley 15 encounters a somewhat severe obstacle, the pulley will be able to rise while carrying along the driving axle inasmuch as the two-branch lever 9, 10 is adapted to rock about the carrying axle 1 and compress the spring 13 with its smaller arm 10.

After the obstacle is passed, the axle will return to its position automatically by the action of gravity and also that of the spring 13.

Obviously, a yielding pad may be arranged between the arm 10 and the abutting member 11 in order to cushion the impact when the axle returns to its normal position.

Referring to the construction shown in Figures 2 and 3, the carrying axle 1 is connected to the driving axle through a pair of superimposed quarter elliptic springs 16 the thick ends of which are rigidly secured to the carrying axle 1. The thin ends of the two springs are clamped over the driving axle 8.

The springs 16 consist of a central main leaf on either side of which there are mounted a number of secondary leaves corresponding to the spring power to be obtained.

It will be appreciated that the said springs are adapted to operate in both directions and are so designed that in their normal position they maintain the driving pulleys at the desired height above the ground. It will be understood that under the action of an obstacle the driving pulley will rise while compressing the upper leaves of the springs 16, and will automatically come back into its position under the action of the said leaves and that of gravity.

The return to normal position will take place without shock since the impact will be absorbed by the bottom leaves of the springs.

It will also be appreciated that the height of the axle will be independent of the deflection of the suspension spring 3 inasmuch as the said axle is associated with the carrying axle to which it is yieldingly connected without any further connection with the chassis of the vehicle.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A driving axle arrangement for vehicles propelled by means of endless tracks wherein a connecting means is provided between the said driving axle and the carrying axle with the object of making the former completely independent of the movements of the chassis with respect to the ground.

2. An arrangement as claimed in claim 1 wherein the connection of the driving axle with the carrying axle is provided at either end thereof by a rigid two-armed lever pivoted on the carrying axle, one of the said arms connecting the said carrying axle with the driving axle while the other arm is arranged vertically above the carrying axle and is adapted to slide between an abutment secured to the chassis and a spring engaging a further part likewise secured to the chassis.

3. The construction in which the driving axle is connected with the carrying axle at either end thereof through a pair of springs the thick ends of which are rigidly secured to the carrying axle and the other ends to the driving axle, the springs consisting of a central main leaf having secondary leaves arranged at either side thereof.

4. The driving axle arrangement for vehicles propelled by endless tracks, substantially as described or substantially as shown in Figure 1, or in Figures 2 and 3 of the accompanying drawings.

Dated this 1st day of April, 1931.

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Fig.1.

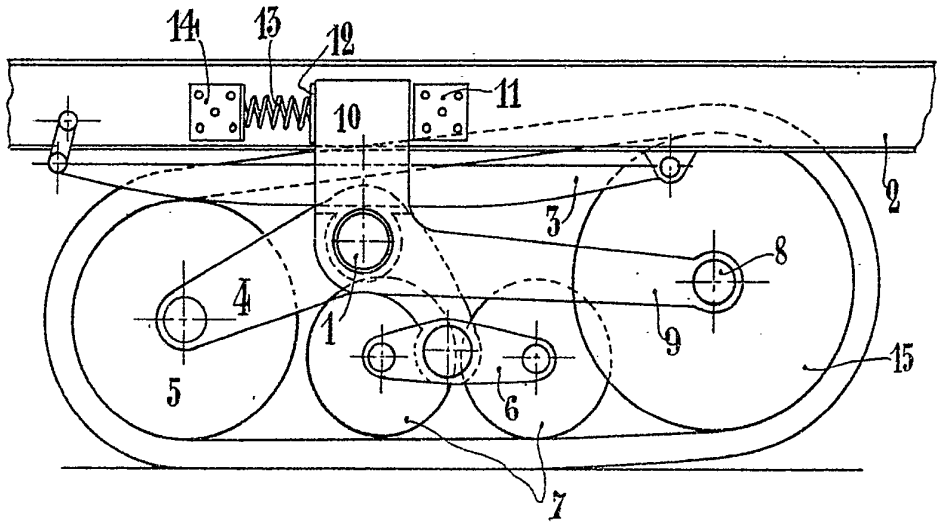


Fig.2.

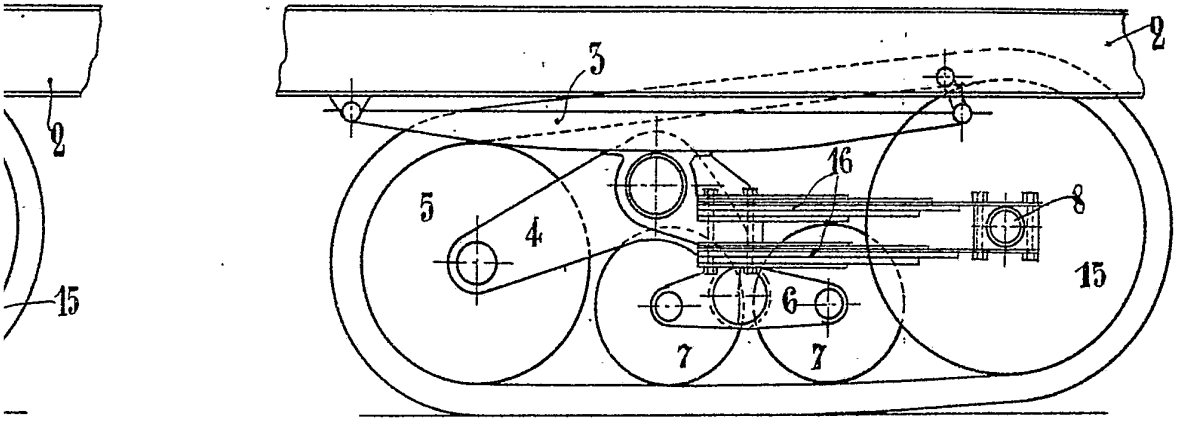
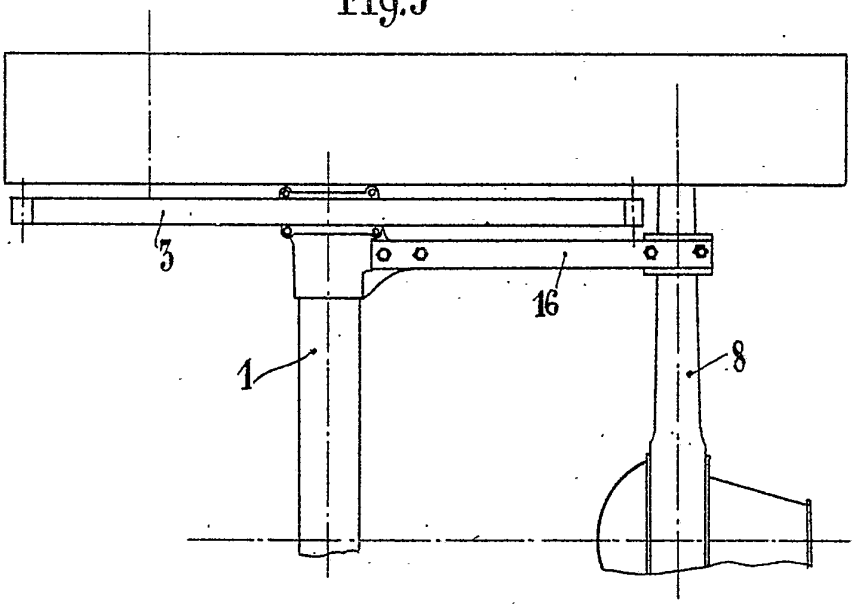


Fig.3



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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig.1.

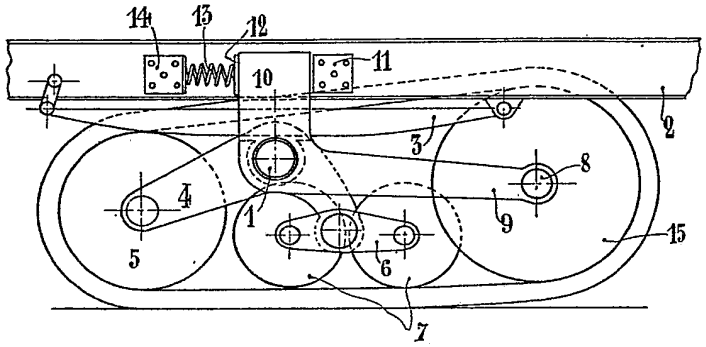


Fig.2.

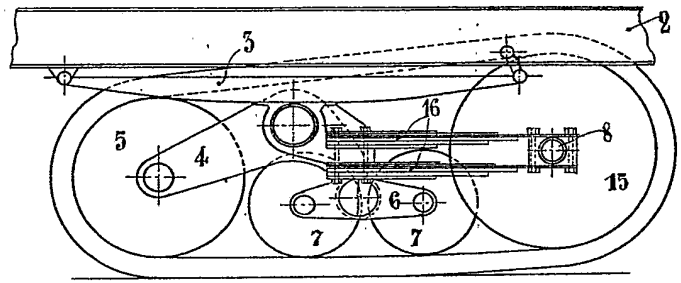
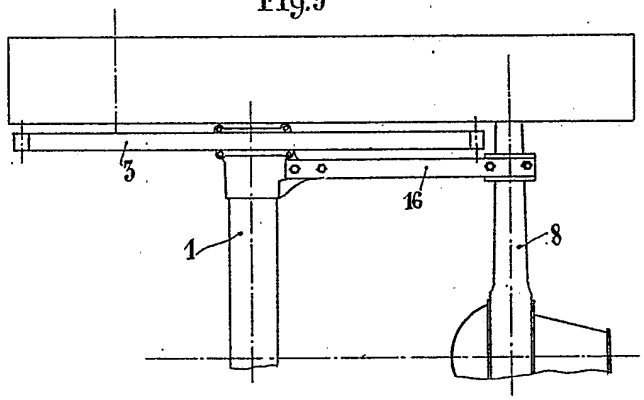


Fig.3



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