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PATENT



SPECIFICATION

Application Date, Feb. 11, 1916. No. 2069/16.

Complete Left, June 15, 1916.

Complete Accepted, Feb. 12, 1917.

PROVISIONAL SPECIFICATION.

Improvements in or relating to Motor Cars Driven by Endless Belts with Load Distributing Rollers.

I, ADOLPHE KÉGRESSE, a citizen of the Republic of France, of Imperial Garage, Czarskoïe Selo, Petrograd, Russia, Technical Manager of the Imperial Garage, do hereby declare the nature of this invention to be as follows:—

The automobile-sleigh driven by an endless belt and forming the subject-matter of the British Patent No. 5015/1913 previously granted to me is provided with a driving mechanism, the end parts of which are connected together by two special tension rods, and with a single pair of rollers, distributing the load on the lower run of the endless belt. In this case only one of the two pulleys supporting the belt is a moving pulley. Moreover, in the construction forming the subject-matter of the patent mentioned, the forward part of the machine is supported by an arrangement representing a combination of wheels and slides.

The present invention relates to a modification of this construction, its main features being as follows:—

1. The arrangement of a driving mechanism consisting of two separate and identical groups, arranged symmetrically in relation to the axle, around which each of these groups can rotate independently of one another;

2. A symmetrical increase of the number of rollers in proportion to the weight of the machine, with the preservation of the same principle of distribution of the load, owing to which fact the running of the vehicle improves especially on an undulating road or other surface when the driving branch of the belt adjusts itself to all the unevennesses of the running surface, under better conditions.

3. The use of a device for automatic tightening of the belt in proportion to the load;

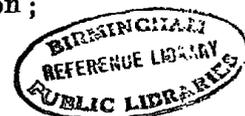
4. The arrangement of special members for taking up the side pressure of the driving mechanism on the rear axle, owing to which a relieving of the axle and mechanism is attained when the vehicle is turning.

5. The application of a similar mechanism with an endless belt in front of the vehicle instead of a combination of wheels and slides.

Reference will now be made to the annexed drawings which represent various embodiments of my invention, and in which Fig. 1 is a side view of the rear driving mechanism with four rollers, the right hand connecting lever between the belt pulley and corresponding rollers being shown in section;

Fig. 2 is a plan view of the same mechanism with the upper run of the belt omitted and one of the groups of rollers shown in horizontal section;

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Figs. 3 and 4 show diagrammatically two embodiments of the invention with six and eight rollers, respectively;

Fig. 5 is a diagrammatic view of a motor car provided with a mechanism having an endless belt on the forward and rear axles, whilst travelling over an undulating running surface.

The load *P* on the axle 1 is not transmitted onto one spring only, as is the case in the said previous patent, but onto two separate springs 2 mounted freely on the axle 1 by means of collars 3 and arranged symmetrically in respect to the longitudinal axis of the mechanism. Each end of both springs rests on a suitably selected point 4 of the lever 5, connecting the driving pulley 6 with the beam 7 pairing the rollers 8. The position of the bearing point 4 determines the part of the load upon the rollers 8 and driving pulleys 6. If this point is, for instance, on the continuation of the axis of the vertical arm of levers 5, then the whole weight of the machine is supported by the rollers 8, while the pulleys 6 will rest on the ground with a pressure due only owing to their own weight. The trunnions 9 of the rollers 8 are supported by the ends of the beams with the aid of bearings having spherical surfaces. The lower part of the levers 5 is also rotatively connected with the free axle 10, connecting the two beams 7. In this way the rollers 8 and levers 7 form a linked quadrilateral system, owing to which fact the pressing rollers can stand small unevennesses of the running surface in the side direction without causing harmful strain in the mechanism. In the longitudinal direction all the unevennesses of the road are taken up by the belt as in the arrangement described in the said previous patent, but with still greater accuracy in view of the increase of the number of rollers.

The transmission of movement to the vehicle is effected for instance, with the aid of pulleys 6, on each of which a sprocket wheel 16 is mounted and driven by means of an endless chain 17 from the sprocket wheels 18 on the axle 1.

The chains 17 may be replaced with a stiff or semi-stiff transmission by means of a shaft and bevel or helical wheels, fastened, on one side, on the axle 1 of the vehicle and on the driving pulleys at the other side.

The automatic tension of the belt in proportion to the load being carried is attained by means of tension rods 11, connecting the driving pulleys 6 with the axle 1. When the load increases the camber of the spring shown above decreases and the axle 1, drawing the upper ends of the tension rods 11 with it, descends, in view of which fact the broken line formed by these rods tends to straighten out into a horizontal line and thus increases the distance between the axles of the pulleys 6.

Two rollers 13 loosely mounted on the inner side of the tension rods and capable of rolling between the guiding arc-shaped frames 14, fastened rigidly to the body 15 of the vehicle, are provided for taking up the side pressure and relieving the rear moving mechanism when the car is turning.

The arrangements with six and eight rollers shown in Figs. 3 and 4 are built on the same principle. It is also possible in very heavy vehicles to use in case of need, ten, twelve and even more rollers.

The use of a similar mechanism with an endless belt in front of the automobile, instead of ordinary wheels or a combination of wheels and slides does not present any difficulty as all the parts are fastened on the end of the axle itself. In this case a driving mechanism with complete contact with the road is obtained, *i.e.*, with two driving axles; it is necessary, however to replace the rollers 13 and guides 14 with rods connected to the steering mechanism.

The belt is preferably provided with a central guide rib according to which the pulleys 6 and rollers 8 have grooves to receive this rib.

Dated this 11th day of February, 1916.

MARKS & CLERK.

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COMPLETE SPECIFICATION.

Improvements in or relating to Motor Cars Driven by Endless Belts with Load Distributing Rollers.

I, ADOLPHE KÉGRESSE, a citizen of the Republic of France, of Imperial Garage, Czarskoïe Selo, Petrograd, Russia, Technical Manager of the Imperial Garage, 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:—

The automobile-sleigh driven by an endless belt and forming the subject-matter of the British Patent No. 5015/1913 previously granted to me is provided with a driving mechanism, the end parts of which are connected together by two special tension rods, and with a single pair of rollers, distributing the load on the lower run of the endless belt. In this case only one of the two pulleys supporting the belt is a moving pulley. Moreover, in the construction forming the subject-matter of the patent mentioned, the forward part of the machine is supported by an arrangement representing a combination of wheels and slides.

The present invention relates to a modification of this construction, its main features being as follows:—

1. The arrangement of a driving mechanism consisting of two separate and identical groups, arranged symmetrically in relation to the axle, around which each of these groups can rotate independently of one another;
2. A symmetrical increase of the number of rollers in proportion to the weight of the machine, with the preservation of the same principle of distribution of the load, owing to which fact the running of the vehicle improves, especially on an undulating road or other surface when the driving branch of the belt adjusts itself to all the unevennesses of the running surface, under better conditions;
3. The use of a device for automatic tightening of the belt in proportion to the load;

4. The arrangement of special members for taking up the side pressure of the driving mechanism on the rear axle, owing to which a relieving of the axle and mechanism is attained when the vehicle is turning.

5. The application of a similar mechanism with an endless belt in front of the vehicle instead of a combination of wheels and slides.

Reference will now be made to the drawings accompanying the Provisional Specification, which represent various embodiments of my invention, and in which Figure 1 is a side view of the rear driving mechanism with four rollers; the right hand connecting lever between the belt pulley and corresponding rollers being shown in section.

Figure 2 is a plan view of the same mechanism with the upper run of the belt omitted and one of the groups of rollers shown in horizontal section;

Figures 3 and 4 show diagrammatically two embodiments of the invention with six and eight rollers, respectively;

Figure 5 is a diagrammatic view of a motor car provided with a mechanism having an endless belt on the forward and rear axles, whilst travelling over an undulating running surface.

The load P on the axle 1 is not transmitted onto one spring only, as is the case in the said previous patent, but onto two separate springs 2 mounted

freely on the axle 1 by means of collars 3 and arranged symmetrically in respect to the longitudinal axis of the mechanism. Each end of both springs rests on a suitably selected point 4 of the lever 5, connecting the driving pulley 6 with the beam 7 pairing the rollers 8. The position of the bearing point 4 determines the part of the load upon the rollers 8 and driving pulleys 6. If this point is, for instance, on the continuation of the axis of the vertical arm of levers 5, then the whole weight of the machine is supported by the rollers 8, while the pulleys 6 will rest on the ground with a pressure due only owing to their own weight. The trunnions 9 of the rollers 8 are supported by the ends of the beams with the aid of bearings having line contact bearing surfaces. The lower part of the levers 5 is also rotatively connected with the free axle 10, connecting the two beams 7. In this way the rollers 8 and levers 7 form a linked quadrilateral system, owing to which fact the pressing rollers can stand small unevennesses of the running surface in the side direction without causing harmful strain in the mechanism. In the longitudinal direction all the unevennesses of the road are taken up by the belt as in the arrangement described in the said previous patent, but with still greater accuracy in view of the increase of the number of rollers.

The transmission of movement to the vehicle is effected for instance, with the aid of pulleys 6, on each of which a sprocket wheel 16 is mounted and driven by means of an endless chain 17 from the sprocket wheels 18 on the axle 1.

The chains 17 may be replaced with a stiff or semi-stiff transmission by means of a shaft and bevel or helical wheels, fastened, on one side, on the axle 1 of the vehicle and on the driving pulleys at the other side.

The automatic tension of the belt in proportion to the load being carried is attained by means of tension rods 11, connecting the driving pulleys 6 with the axle 1. When the load increases the camber of the spring shown above decreases and the axle 1, drawing the upper ends of the tension rods 11 with it, descends, in view of which fact the broken line formed by these rods tends to straighten out into a horizontal line and thus increases the distance between the axles of the pulleys 6.

Two rollers 13 loosely mounted on the inner side of the tension rods and capable of rolling between the guiding arc-shaped frames 14, fastened rigidly to the body 15 of the vehicle, are provided for taking up the side pressure and relieving the rear moving mechanism when the car is turning.

The arrangements with six and eight rollers shown in Figures 3 and 4 are built on the same principle. It is also possible in very heavy vehicles to use, in case of need, ten, twelve and even more rollers.

The use of a similar mechanism with an endless belt in front of the automobile, instead of ordinary wheels or a combination of wheels and slides does not present any difficulty as all the parts are fastened on the end of the axle itself. In this case a driving mechanism with complete contact with the road is obtained, *i.e.*, with two driving axles; it is necessary, however, to replace the rollers 13 and guides 14 with rods connected to the steering mechanism.

The belt is preferably provided with a central guide rib according to which the pulleys 6 and rollers 8 have grooves to receive this rib.

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 modification of the automobile vehicle described in British Patent No. 5015/1913, driven by means of endless belts with pressure rollers, characterised by the fact that the driving mechanism consists of two separate and identical groups arranged symmetrically in respect to the axle (1), around which each of these groups can rotate independently of the other, the transmission of the load, acting through the axle (1), on the pressing rollers (8),

the number of which may be four, six, eight or more, being effected by means of two springs (2) mounted loosely with their collars (3) on the axle (1) and resting with their ends on a correspondingly selected points (4) of the levers (5), connecting the axle of the driving pulleys (6) with the beams (7), carrying the pressure rollers (8).

2. A constructional form of the automobile vehicle claimed in Claim 1, characterised by the fact that the pressing rollers (8) are supported with their end trunnions by bearings of the pairing beams (7), having line contact bearing surfaces, so that the rollers and beams form a linked quadrilateral system.

10 3. A constructional form of the automobile vehicle claimed in Claim 1, characterised by the fact that the rotation of the driving axle (1), is transmitted to both endless belts by means of mechanical transmission symmetrically arranged in respect to this axle.

15 4. A constructional form of the automobile vehicle claimed in Claim 1, characterised by the use of a device for the automatic tension of the belt in proportion to the weight being carried, which device consists of rods 11, connecting the axle (1) with the axles of pulleys (6) and acting in such a manner that the greater the load on the axle (1), the greater will be the distance of the pulleys from one another.

20 5. A constructional form of the automobile vehicle claimed in Claims 1 and 4, characterised by the fact that rollers (13) are rotatively fastened to the interior side of the inner rods (11), said rollers being pressed when the vehicle is turning, to the arc-shaped guide frames (14) fastened rigidly to the body of the vehicle.

25 6. A constructional form of the automobile vehicle claimed in Claim 1, characterised by the fact that its front axle is provided with a similar mechanism having an endless belt, but without side thrust bearings as in Claim 5, which are replaced in this case by rods connected to the steering mechanism.

30 7. The improved automobile vehicle, suspended and driven, substantially as hereinbefore described and as illustrated in the accompanying drawings.

Dated this 15th day of June, 1916.

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Fig. 1.

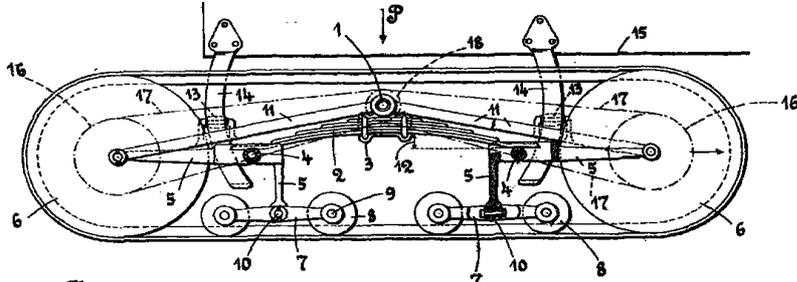


Fig. 2.

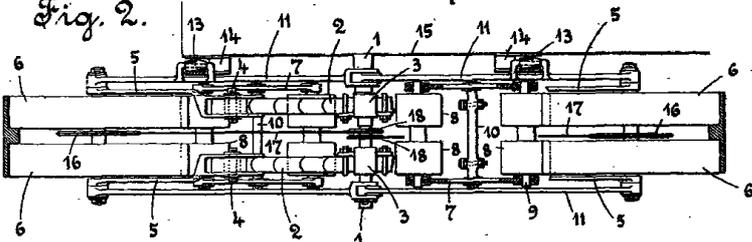


Fig. 5.

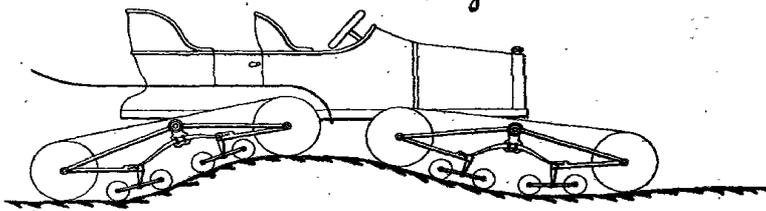


Fig. 3.

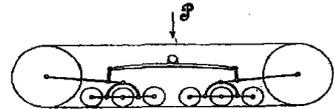
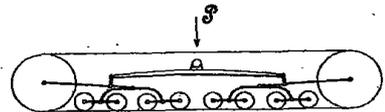
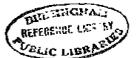


Fig. 4.



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Fig. 1.

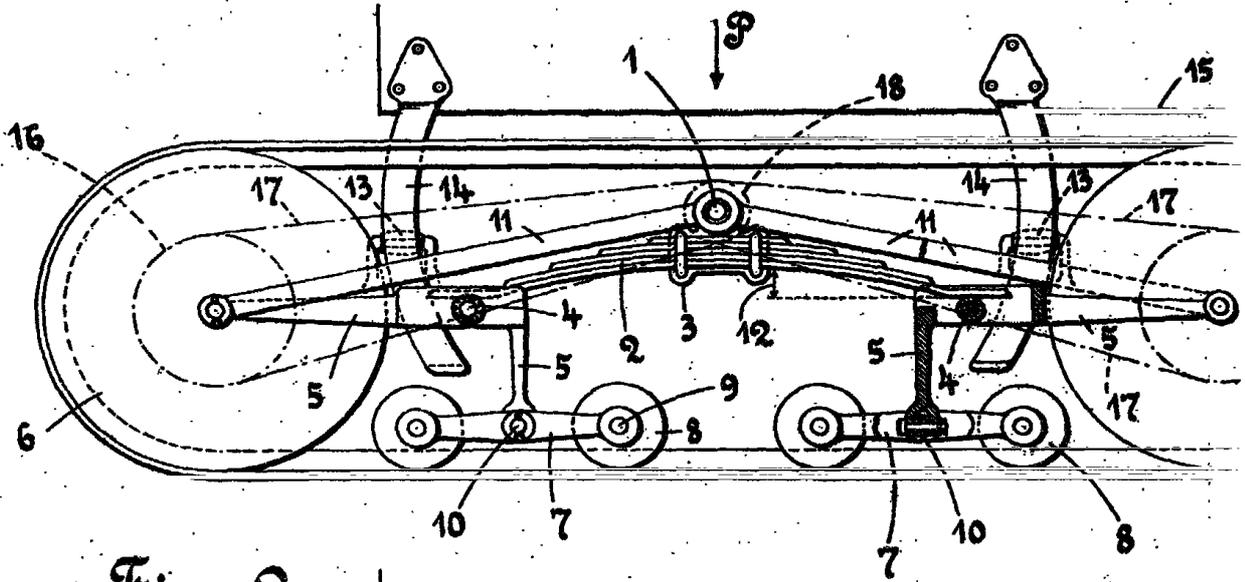


Fig. 2.

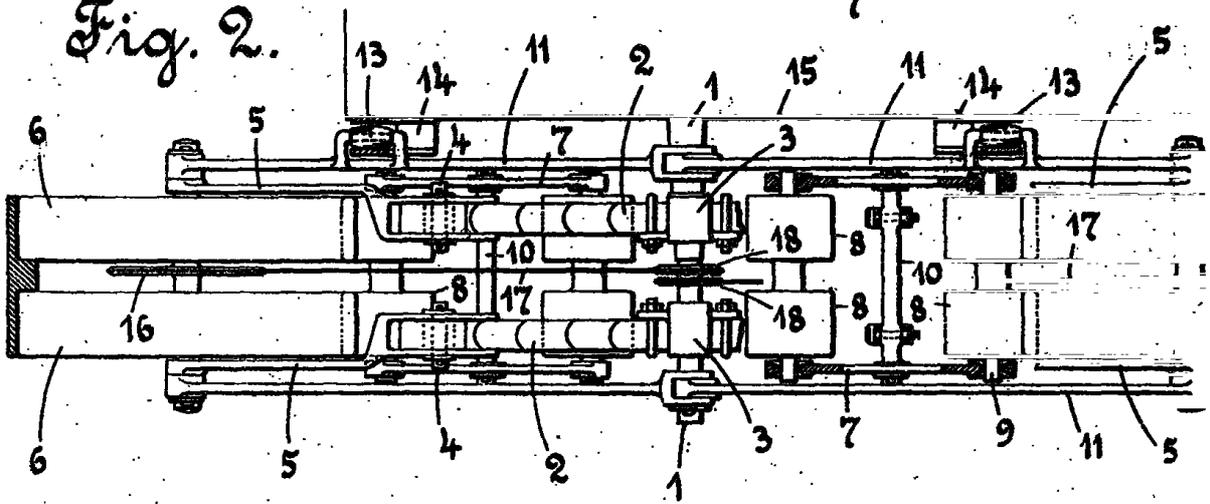
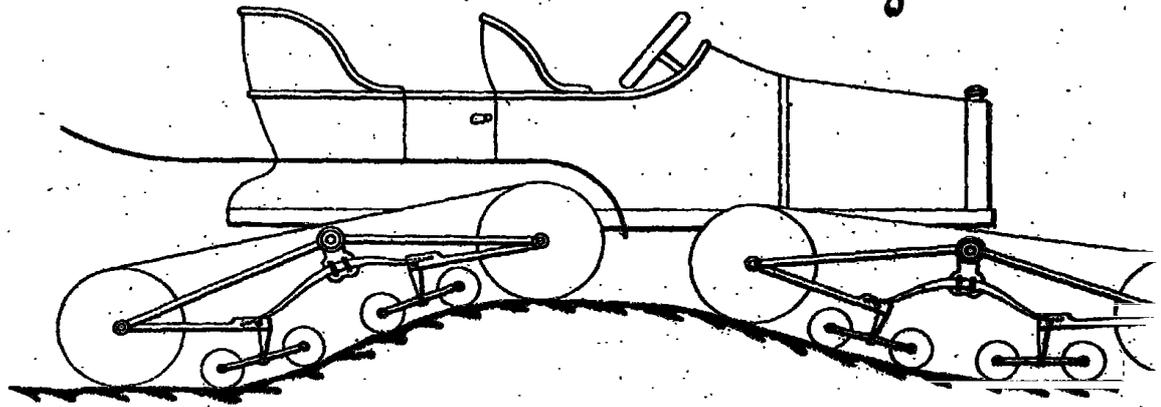


Fig. 5.



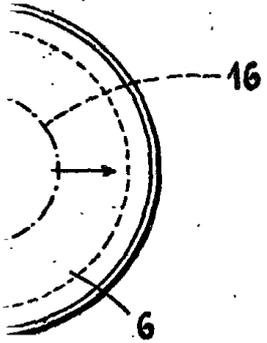


Fig. 3.

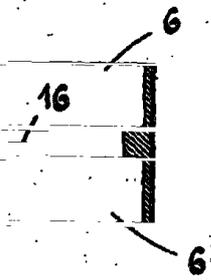
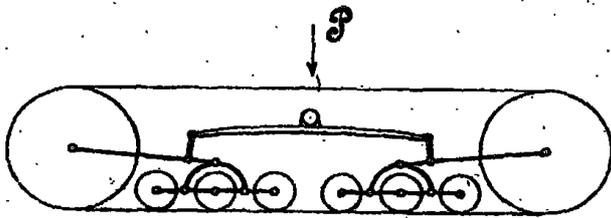


Fig. 4.

