

# PATENT SPECIFICATION



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## COMPLETE SPECIFICATION.

### Improvements in or relating to Endless Track Vehicles.

I, ADOLPHE KEGRESSE, a citizen of the French Republic, of 7, rue Salomon de Rothschild, Suresnes, France, 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 an improvement on the device described and claimed in the prior Patent Specification No. 263,863, in which the middle ground tread is kept in position by means of small bars or hooks that impart no cross rigidity to the endless band. The proper operation of a flexible endless track with continuous roller and ground treads, said treads being independent of one another, requires furthermore an arrangement of the treads respectively to one another. As a matter of fact, according to this invention both these treads offer an equal developed length in order to avoid any relative shifting, which shifting causes rapid deterioration.

In the accompanying drawings, by way of example:—

Figure 1 is a section through the line A—B of Figure 2, the latter showing in elevation a portion of an endless track the ground tread of which is a detachable pneumatic tyre.

Figure 3 is a plan view of Figures 1 and 2.

Figure 4 is a sectional view of a modification.

Figure 5 illustrates, in section also, the mounting of a detachable ground tread tyre made of solid plastic material.

Figure 6 is a view in elevation, and

Figure 7 a plan view of the solid tyre shown in section in Figure 5.

On the flexible endless band 1 (Figures 1 and 2) serving as a tread for the rollers 2, are secured at even intervals and almost contacting metal hooks or small bars 2<sup>1</sup> (Figures 1, 2 and 3) fitting the whole width of the band and suitably shaped to receive on their outer face a detachable band or tyre 3 forming a ground tread and shown as a pneumatic tyre on Figure 1.

On each side of the detachable tyre 3,

cables 4 are mounted, stretched and hooked on small bars or plates 2<sup>1</sup> in such a way as to avoid, while running, any longitudinal shifting of said cables with regard to said hooks or small plates. The inner face of the small metal plates 2<sup>1</sup> is attached to the flexible endless band 1 by means of bolts 5 that secure at the same time the guide and driving beads 6 of already known type.

Obviously, cables 4 might be replaced by superimposed canvas layers, metal or other braids, etc.

Cables 4, which are more rigid than flexible band 1, govern the developed length of the system. The bead 7 that secures the tyre 3 being set in the same plane as the cables 4, will have the same developed length as the latter and, consequently, the same speed as they have. Therefore, there will be no tendency to relative motion between the ground tread and the rest of the system.

It will be apparent that, owing to rigid small cross plates 2<sup>1</sup> secured very close to, and almost contacting with, one another on the face of roller tread 2 opposite the one upon which the rollers roll, said rollers will when negotiating hard grounds, roll suspended at a height above the ground corresponding to the height of the ground tread, while, when negotiating soft grounds, the intermediate ground tread will sink and the band will then bear upon the whole of its width. The small metal plates 2<sup>1</sup> will therefore serve as a protection for the roller tread band.

Said combination enables the construction of extremely broad flexible endless tracks for soft grounds, while offering on hard grounds, such as, for instance roads, a narrow and continuous resilient tread.

It should also be noted that the rollers need not be as broad as their flexible treadway; they may be narrower, since the rigid small cross plates can well carry a marked overhang.

It will also be seen that the metal plates being secured quite close to one another the small metal plates ensure perfect continuity for the roller treadway. As will be readily

realised, anything like a satisfactory speed could not, failing this condition, be obtained. Indeed, supposing the small plates to be somewhat spaced, it would be immediately seen that the carrier rollers would, under the influence of their load, bend down the flexible band 1 on which they would roll over the intervals between the small plates, whereby there would be caused jars and ups and downs in the roller running, precluding speed and prejudicial to proper maintenance of the system.

Figure 4 illustrates, in section, an endless track with independent treadways wherein the roller treadway is composed of two flexible endless bands 1<sup>1</sup> (Figure 4) independent of one another. Said two bands 1<sup>1</sup> are connected with one another by suitably shaped small plates 2<sup>1</sup> very closely set, like plates 2<sup>1</sup> of Figures 1, 2 and 3. These plates 2<sup>1</sup> (Figures 4, 5 and 7) are designed to receive on one of their faces and at the middle thereof, the ground tread band 3 (shown on Figure 4 as a pneumatic tyre and, on Figures 5, 6 and 7, as a solid tyre) while they receive on their opposite face and on each side of the ground treadway, the two independent flexible bands 1<sup>1</sup> (Figures 4, 5, 6 and 7) that serve as a continuous treadway for the rollers.

The treadbands 1<sup>1</sup> may be secured to the small plates 2<sup>1</sup> either by means of screws and nuts or of rivets 12 countersunk into the band (Figure 4), or be hooked on in any suitable manner, a method of which is shown by Figures 5, 6 and 7 wherein the edges 13 of the small plates 2<sup>1</sup> are clamped or beaten down on the treadbands.

The guide and driving beads 6 (Figures 4, 5, 6) are secured by means of bolts 5 directly on small plates 2<sup>1</sup>.

In this case, the average developed length is given by the two roller treadbands and the tyre fixing head which are at the same level.

It should be noted that the ground treadway fixing beads are manufactured so as to be less flexible than the remainder of the tyre, so that the developed length of the bead governs, as it were, the actual developed length of the remainder of the tyre.

It will be quite easily realised that, for instance with the solid tyre shown by Figures 5, 6 and 7, the bead of said tyre may be constituted by canvas or by some comparatively hard gum, while the remainder of the tyre is made of softer rubber, and therefore will be resilient.

Moreover, the part of the tyre that contacts with the ground has scallops or indentations 16 (Figures 6 and 7) that

improve both grip and flexibility so that said tyre will readily lend itself to any required deviations or distortions.

Similarly, with the type shown by Figure 4, it is a well known fact that the bead of a pneumatic tyre is well nigh inelastic while the cover itself together with its inner tube lends itself to all sorts of distortions.

In this case (Figures 4, 5, 6 and 7) as in the case shown by Figure 1, the rigid small cross plates permit the rollers to be suspended above the ground when running on hard ground and limit sinking when negotiating soft surfaces. In the same way, as in the former case, the plates 2<sup>1</sup> (Figures 4, 5, 6 and 7) are set very close to, almost contacting with, one another in order to avoid sagging of the roller tread flexible bands 1<sup>1</sup> between the plates, which would prove as already stated, the reverse of conducive to rapid running and would rapidly damage the bands 1<sup>1</sup> as well as the mechanism.

As will be apparent from the foregoing, the main characteristics of the invention consist in the fact that rigid small cross-plates are interposed between the continuous roller treadways and the ground tread (said plates set very close to, almost contacting with one another, ensuring even roller rolling at a certain height above hard ground while limiting sinking when negotiating soft ground) and, also in the feature that the predetermined section of said plates permits roller treadways to be mounted on one of their faces and the ground treadway to be mounted on the other face, said section being so designed that the practical mean developed length of both treadways is the same.

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. An improvement in the endless track for vehicles described in Specification No. 263,863 characterised by the fact that the roller treadway and the ground tread fixing bead are arranged in such a way that said treadway and said ground tread have the same developed length, thereby permitting of avoiding the relative longitudinal shiftings to which they would otherwise be liable.

2. An endless track as claimed in Claim 1, characterised by the fact that suitably shaped rigid cross metal plates or hooks serve as a connection between the roller treadway and the intermediate ground tread, said plates furthermore enabling the rollers to run at high speed while suspended in space clear above hard ground

while limiting sinking when negotiating soft ground and protecting the roller treadway, said plates being set very close to, almost contacting with, one another, in order to avoid sagging of the flexible roller treadway under the roller pressure.

5 3. An endless track as claimed in Claim 2, characterised by the fact that the plates are of a predetermined section so  
10 designed that the roller treadways are in the same plane as the ground treadband securing bead, this feature ensuring one and the same developed length for the treadways.

15 4. An endless track as claimed in Claims 2 and 3, characterised by the fact

that the rigid cross plates are adapted to receive cables or plaits mounted in the same plane as the ground treadway securing bead in order to ensure a proper developed length for the whole system. 20

5. In an endless track as claimed in any of the foregoing claims, treadways constituted by pneumatic tyres or made of plastic material substantially as 25 described.

Dated this 19th day of December, 1927.

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





