

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in or relating to Endless Track Vehicles.

I, ADOLPHE KEGRESSE, a French citizen, of Suresnes, Seine, 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:—

Positively driven flexible endless tracks with detachable elements are already known. However, the known endless tracks of this type do not fulfil the first condition for high speeds, viz. the necessary continuity and uniformity or homogeneity of the tracks for the rollers and on the ground. It is clear that this condition not being obtained, the supporting rollers cannot have the indispensable smooth running, because the lack of uniformity or homogeneity of the tracks impart to them oscillations and vibrations incompatible with speedy running.

On the other hand, the known positively driven endless tracks comprise articulated metallic parts after the fashion of transmission chains, or again metallic toothing of the rack type.

In one or the other case the driving system acts at the same time as a guide for the band.

The disadvantages of articulations in metallic endless tracks are known. One is also aware that if an endless band is to be driven by means of teeth, it is necessary for the latter to be of suitable shape and of dimensions small enough to avoid highly detrimental friction, as well as the consequences of an always possible lengthening. Now it has been acknowledged that if the guiding of a flexible band is to be effective on all soils, the limited size of the teeth of the driving systems now used is not satisfactory.

This invention has for its object a flexible metallo-plastic endless track free from the above disadvantages.

In the accompanying drawings and as examples;

Figure 1 is a general elevation view of the endless track with two partial cross sections along A—B and C—D of Figure 2 respectively.

Figure 2 is a cross section along the line a—x of Figure 1.

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

Figure 4 is a half cross-section of an alternative of Figure 2.

Figure 5 is the half cross-section of another alternative.

Figure 6 is a plan view of the outside of Figure 4.

Figure 7 is the same view of Figure 5.

The core of the endless track is formed by an endless band 1, flat on both faces and made of a flexible material such as leather, rubberised fabric, etc. of suitable strength.

On the inside face of such band 1, in the middle and on the whole length thereof, are mounted the blocks 2 (Figures 1, 2, 4, 5, 6 and 7) which, in the positively driven endless track, serve for guiding purposes exclusively. The bottom of these guiding blocks is rounded longitudinally to a radius corresponding to that of the smallest of the two pulleys supporting the endless band, so that the rolling on of the latter on the pulley is not hindered.

On the other side of belt 1, i.e. that which faces the ground, small metal plates 3 are applied, which are arranged side by side and nearly touching one another. These plates 3 have ribs 4 of different height by which they are given the necessary strength. These ribs also act as cramps in soft grounds.

Flexible pads 5 made of suitable material are clamped at their bases on two faces between the ribs 4. These flexible pads, which are arranged so that they very nearly touch one another along the band, are what forms a continuous track on hard grounds such as roads.

In order to improve ground adhesion, the flexible pads may be staggered (Figures 2 and 3) but with a definite overlap (Figure 3) in the direction of the longitudinal axis of the band, provided that this arrangement is not detrimental to continuous rolling on the ground.

A bolt 6 (Figures 1 and 2) fastens the guiding blocks 2, the plates 3 and the flexible pads 5 on to the flexible band 1. Therefore, there is an equal number of

guiding blocks, plates, flexible pads and fastening bolts on the band.

On both sides of the guiding blocks 2 (Figures 2, 4, 5, 6 and 7) teeth 7 are provided, which are intended for the driving of the endless belt. Such teeth 7 are fastened (riveted or bolted) on the metal plates 3 and extend through the endless belt in suitable openings, as can be seen at *b* on Figures 1, 2 and 4.

The teeth 7 and the bolt 6 are on one line parallel to the axes of the pulleys supporting the endless belt. The small projection of these teeth 7 on the inside of the core of the endless tracks engages in openings 8 of the driving pulley 9 (Figure 1) so as to ensure the positive driving of the whole system.

The teeth 7 may be either cylindrical as shown in Figures 1, 2, 5 and 6 or rectangular as may be seen in 7¹ of Figures 4 and 6.

The alternative given in Figure 5 shows, in cross section, an endless belt in which the length of plates 3 is greater than the width of belt 1. This arrangement enables endless belts of very large bearing surface to be provided by a flexible belt of comparatively limited dimensions.

The other alternative shown in Figure 4 partakes of the same principle as above with this difference that the driving teeth 7 are secured to the free end of the plate which is given a suitable shape.

It is understood that teeth 7 might as well be secured to the end of plate 3 in Figure 4, outside the belt, without changing anything in the nature of this invention.

Therefore, it may be seen that:

1. The endless belt is driven by very low double teeth giving a minimum of friction and being independent of the guiding system which is suitably dimensioned to fulfil its duty on all soils effectively.

2. Both teeth 7 of each plate 3 projecting through the endless belt 1, are arranged on both sides of the guiding block 2 and on a straight line perpendicular to the longitudinal axis of the belt, i.e. parallel to the axes of the pulleys supporting the endless track; the fastening bolt 6 also lies on the same line.

Such arrangement retains for the endless belt its whole rolling flexibility over the pulleys, since the stiff plates 3 are external and connected to the band by parts which are located on one single line parallel to the rolling pulleys.

3. The driving force taken up by teeth 7 is transmitted by same, in the case of Figures 1, 2, 3 and 5 directly to the endless belt, without any intermediate part.

4. The driving of the belt is completed

by bolts 6 fastening between them all the parts of the endless track, which, together with the double teeth 7, ensures a most uniform pulling tension on the whole width of the belt.

5. The continuity of the track for the rollers is provided, inasmuch as, on account of the plates being mounted so as nearly to touch one another, the endless belt cannot bend between the plates under the passage of the rollers.

6. The flexible pads 6 ensure a continuous rolling on the ground as they are themselves similarly mounted so as nearly to touch one another.

7. All parts are detachable and fastened together by one single bolt, the driving teeth belonging to plates 3 on which they are permanently secured.

8. On hard grounds, only the narrow flexible pads 5 bear on the ground, and the duty of plates 3 is just to support the rollers which so to speak roll on empty space. The ribs 4 of the plates provide the necessary stiffness and serve as bearing faces for the bases of the flexible pads in the direction of running.

9. The staggered arrangement of the flexible pads 5 provides a better grip on all soils without detrimentally affecting the continuity of rolling on the ground, since the staggering of one pad relatively to adjacent pads in the direction of running is not complete, and there remains a sufficient overlap to provide continuity of rolling.

10. On soft soils, the flexible pads 5 sink and the plates 3 bear on the ground. The ribs 4 then come automatically into action as gripping cramps.

11. In endless tracks with very large bearing surface, the plates 3 may be made longer than the width of the belt (Figures 4 and 5), the outstanding portion being if necessary made to bear the driving teeth.

All the features of the belt which is the object of this Specification may be applied to non-positively driven endless tracks as well. In such cases it is obvious that the driving teeth are no longer provided, such driving being obtained, for instance, by means of guiding blocks of already known types.

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 endless flexible metallo-plastic positively driven band for vehicles, characterised by a belt, of suitable strength, provided on one face with guiding blocks and, on both sides of same and projecting from the face of the track for the rollers, positive-drive teeth independent of the

guiding system, and on the other face, ribbed metal plates arranged so as nearly to touch one another, bearing on one side the double driving teeth and, on the other side flexible detachable pads forming a central and continuous track on the ground.

2. An endless flexible band as claimed in Claim 1, characterised by the fact that

10 (a) the fastening bolt for the detachable parts and the double positive driving teeth are all three on as straight a line as possible, parallel to the axes of the pulleys bearing the endless track.

15 (b) the positive drive teeth which project out of the roller track face are independent of the guiding system and fixedly secured to the plates arranged on the outer face of the belt and extend through the same so as to impart the driving pull directly to it.

20 (c) Flexible detachable pads, much narrower than their supporting plates, are mounted so that they nearly touch one another in the longitudinal direction in order to form a continuous central rolling track on the ground.

25 (d) Flexible pads are mounted so that they nearly touch one another, and are much narrower than their supports, these pads being longitudinally staggered, but with a certain overlap by which the continuity of the track rolling on the ground is ensured.

30 (e) Metal plates of suitable strength

are arranged on the outside face of the belt forming the core of the endless track so that they nearly touch one another, and act as supports for the flexible roller-track by bearing with their central part on flexible detachable pads forming a central running track on the ground, such plates being automatically kept in balance on the flexible pads at a certain distance from the ground by the pressure of the rollers themselves.

(f) The metal plates are arranged so that they nearly touch one another on the outer face of the belt which forms the core of the endless track, and have external ribs provided so as to have three functions:

Ensure the stiffness of the plate,
Clamp, in the longitudinal direction of the endless belt, the base of the flexible pads.

Act as gripping cramps on soft grounds.

3. An endless flexible band including all the above features, with the exception however of the driving teeth, the drive being obtained if necessary by means of guiding blocks in an already known manner.

Dated this 9th day of February, 1928.

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

Fig.1.

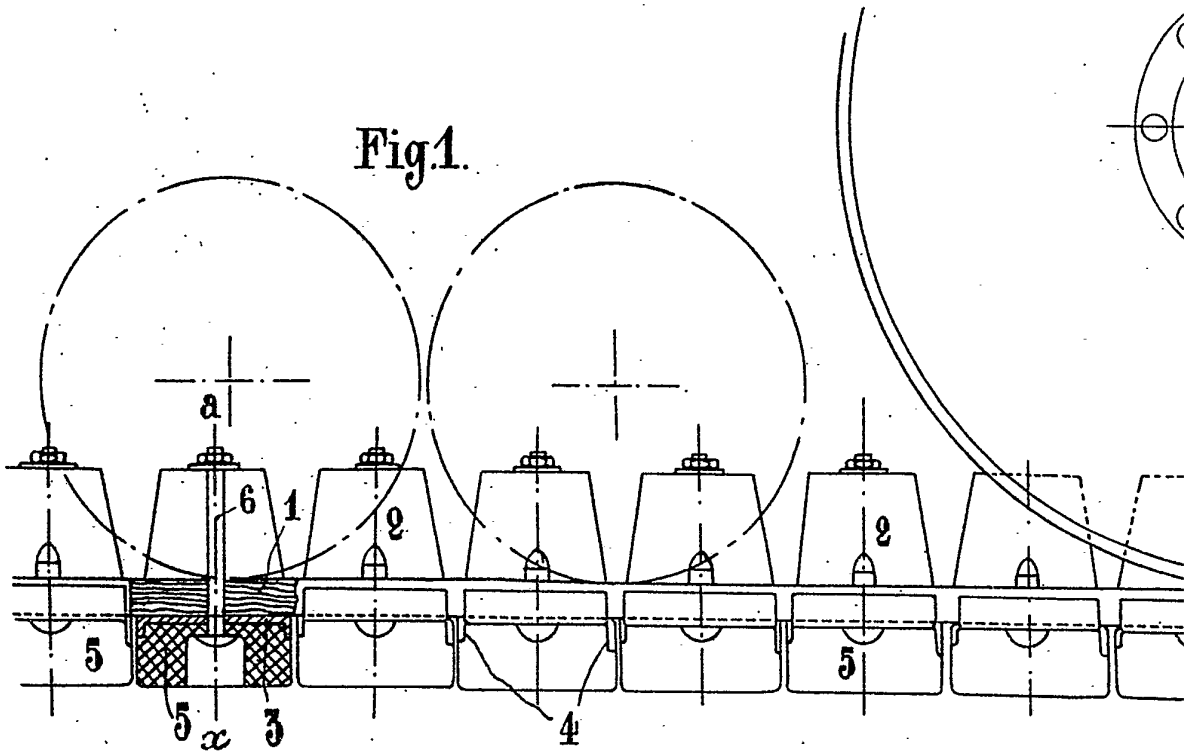


Fig.3.

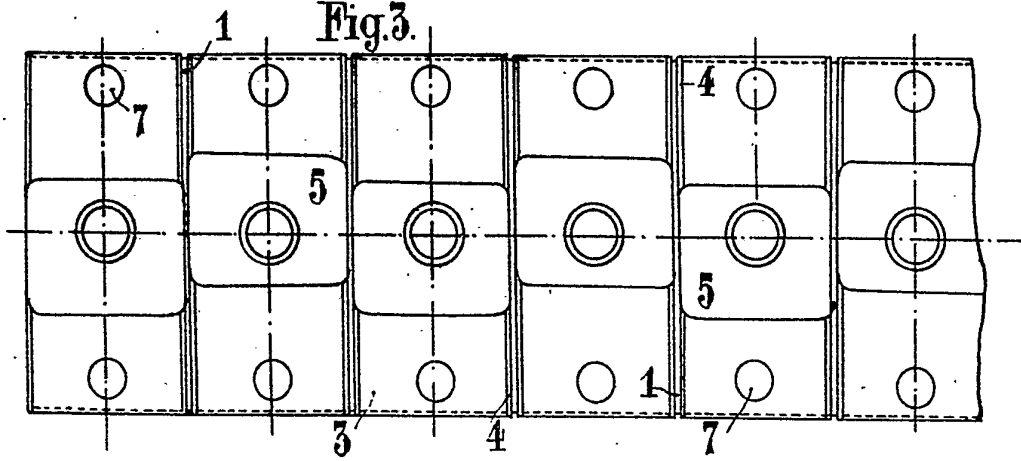


Fig.7.

