

PATENT SPECIFICATION

406,589

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COMPLETE SPECIFICATION.



Improvements in Tracks for Endless Track Vehicles.

I, ADOLPHE KEGRESSE, of 156, rue Armand Silvestre, Courbevoie, near Paris, 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:—

The invention relates to tracks for endless track vehicles of the type in which the supporting rollers run on a flexible belt which is provided on one side with guiding and driving elements and on the other side with metal plates carrying tread blocks of resilient material.

Although all the elements mounted on the belt are detachable and independent of each other, this cannot be said of the belt, which is formed of one piece. This is evidently a very considerable disadvantage, because if any portion of the belt is damaged, the latter will have to be discarded within a short time. It even happens sometimes that breaks occur in the belt of a new or almost new track, which involves not only the rejection of the belt itself, but also a fairly considerable expenditure of labour for dismounting and recovering the detachable elements of the track which are themselves undamaged.

This lack of absolute reliability of the endless belt comprising a single piece of material obliges the users of vehicles employing such belts to have a spare complete track always available in case of an emergency.

There is therefore a very considerable interest in endeavouring to provide a belt composed of separable sections which, as in the metal tracks for endless track vehicles, are adapted to engage each other in some manner so that they can be assembled or taken apart according to requirements.

In tracks of the type in which a series of track plates are connected to one or more ropes to form an endless track it is indeed known to connect adjacent track plates by one or more short rope sections extending from one track plate to the next. In these constructions, however, the ropes merely serve as connecting

links and are not called upon to provide a track for the supporting rollers, so that the conditions are considerably less arduous and exacting than in the case of the belt tracks to which the present invention relates.

In other branches of industry, use has always been made of transmission belts assembled by many different mechanical means. Sewn belts are also employed.

Unfortunately, none of the known means is applicable in the present instance, the conditions in which the belts are employed being quite different from those under which transmission belts operate. In fact, whereas in these other industrial applications, the belts are employed merely for transmission by non-positive drive namely by simple friction, in the present application belts are subjected to far more severe conditions.

Endless track vehicle belts must ensure traction. Experience has shown that for this purpose a positive drive is essential, whence the absolute necessity for a very uniform elongation in order to keep the pitch of the teeth on the belt quite regular. Furthermore the belt must offer under the rollers an absolutely continuous rolling track without irregularities at the risk of shocks incompatible with correct working, while at the same time allowing of high working speeds of the order of 20 metres or more per second.

In addition, the belt must be flexible, in order to ensure a high efficiency, be silent in operation, not require any maintenance, not be injured by mud, sand or snow, be of moderate price and so on.

All these desiderata, which heretofore it has only been possible to obtain by endless belts (which moreover are being employed more and more in industry when considerable efforts have to be transmitted at high speeds) show the real difficulty there is in providing a belt having detachable elements for driving endless track vehicles.

This also explains why heretofore the said sectional belts have not been found in tracks for endless track vehicles which must moreover be light, of simple con-

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struction and of low cost.

The present invention comprises a track of the type described in which the belt is formed of two or more detachable and interchangeable sections each carrying one or more complete sets of driving and tread elements.

The invention also extends to the section of track per se each comprising a length of belt carrying one or more complete sets of driving, guiding and tread elements and provided at each end with means for effecting connection with other sections of track.

It will further be clear that a single length of belt carrying a number of complete sets of driving, guiding and tread elements and provided with connecting means at its ends may be used alone as an endless track, and although under these conditions the advantage of being able to replace part of the belt is lost, the arrangement may possess other advantages for particular purposes over endless belts.

The accompanying drawings and the following description show by way of example alternative methods of carrying the invention into effect.

Figure 1 shows a first example, in part section, of an arrangement according to the invention,

Figure 2 is a plan view of Figure 1.

Figure 3 shows in part section another form of practical construction.

Figure 4 is a plan view of Figure 3.

If the mode of working of a metal-rubber track of the type described is examined closely, it is found that the endless belt is jammed on each metal plate to which is attached the corresponding tread block and driving tooth, along a line perpendicular to its longitudinal axis by the bolts which secure the guiding and driving elements. This jamming acts over a certain length, that is to say over several centimetres, on either side of the aforesaid line, thus creating an area which is termed hereinafter the "neutral or clamping zone" over which area the belt possesses no flexibility.

One of the features of the present invention is to make use of this "clamping zone" to effect the assembling of the constituent sections of the belt.

Another no less important feature is the utilisation of the guiding and driving elements, the metal plates appropriate for this purpose and their securing bolts to effect the assembling of the ends of the belt sections to each other.

In figure 1, the sections comprising the belt are denoted by 1. As will be seen in the Figure, these sections are arranged to touch each other end to end on the

clamping line 2 (figure 2). The metal plates 3 and the supports for tread blocks 4, carry a series of studs 5 (Figure 1) which are fixed to the plates 3 by any known means.

By way of example, Figure 1 shows one of the studs 5 screwed to the plate 3 while the other adjacent stud 5 is fitted into a taper hole and rivetted or welded. Of course, the number of the studs 5 and their arrangement and the method of securing the same may vary. In Figure 2, they are arranged in offset relationship, but they are all in the neutral zone and on either side of the clamping line 2 (figure 2). The studs 5 pass through holes in the ends of the belt sections.

The belt sections are also provided with holes or notches 6 through which pass the clamping bolts and the guiding elements 7 and driving elements 8 (Figure 1).

The said elements being fixed in position, it will be quite readily appreciated that the belt ends will be assembled together without detriment to the flexibility of the system, which will remain the same as in the case of an endless track belt formed in a single piece.

It is also possible to provide belt sections with reinforced and thickened ends, which are shown by way of example in Figures 3 and 4. It will be seen that the belt section 1 has been reinforced at its ends 9 (Figure 3), the thickened portions tapering sharply down to the normal thickness and the plates 3 being provided with recesses into which fit the corresponding reinforcements 9 of the ends of the belt 1.

It will likewise be seen in the figures that the belt section 1 carries two sets of elements: plates, blocks, guiding and driving elements and so on.

The studs 5 are shown tapered in Figure 3. In this way, they allow the use of smaller holes in the belt.

In addition, the reinforcement 9 possesses the considerable advantage of serving as a support for the belt end against the corresponding part 10 (Figure 3) of the metal plate 3. This support may be provided for example along a more or less obtuse angle. In the case shown in Figure 3, it will be seen that the bolts of the guiding and driving elements cause the reinforcement 9 to bear strongly against the plate 3, and it follows that the inclined part 10 participates to a considerable extent in the traction efforts of the belt 1, thus relieving the studs 5, the number and size of which may accordingly be reduced.

The inclined plane 10 (Figure 3) has

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also the effect of rendering it possible to obtain a tension on the belt sections at the moment the bolts for the guiding and driving elements are tightened.

5 It will be in fact appreciated that, since adjacent plates 3 have to be mounted to touch each other, it would be difficult to obtain from the belt element, at the moment of assembling, the
10 necessary tension for its satisfactory working. The inclined plane 10 provides the means for obtaining this tension automatically.

The studs 5 may be extended upwardly
15 to form a projecting part 11 (figure 3) which engages the guiding and driving elements. This, while increasing the strength of the studs 5, which are thus anchored at both ends, serves as a stop for
20 the guiding and driving elements to prevent the same from turning about their securing bolts.

As previously indicated the invention may be applied equally well to tracks in
25 which the belt is in one piece, the ends being joined together as described, and to tracks in which the belt comprises a plurality of sections connected together.

In this latter case, it is quite possible
30 to construct a track for endless track vehicles, which track would have as many belt sections as there are metal plates and guiding and driving elements.

It is likewise possible to construct a
35 track composed for example of ten belt sections for forty guiding and driving elements; plates and shoes, each belt section thus carrying four plate-guiding and driving
40 elements. It will be appreciated that the invention renders it possible to provide all desired combinations. The choice of the latter will be guided by questions of a practical nature affecting
45 above all the cost price and the weight, which will vary furthermore with the size of the track.

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

1. A track of the type described, for endless track vehicles, characterised in that the belt is formed of two or more detachable and interchangeable sections
55 each carrying one or more complete sets of driving, guiding and tread elements.

2. Track of the type described, for endless track vehicles, comprising a length of belt carrying one or more complete sets
60 of driving, guiding and tread elements and provided at each end with means for effecting connection with other sections of track.

3. Track according to claim 2, characterised in that the ends of the length of belt are connected to the metal plates forming part of the track.
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4. Track according to claim 2, characterised in that the ends of the length
70 of belt are adapted to be connected by being clamped between the guiding and driving elements and the plates carrying the tread blocks.

5. Track according to claim 4, characterised in that the ends of the length
75 of belt are thickened and the plates, driving and guiding elements serving as connectors are adapted to receive the thickened ends.
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6. Track according to claim 5, characterised in that the thickened part of the belt tapers sharply down to the normal thickness and a correspondingly shaped recess is provided in the plate serving as a connecting element.
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7. A belt section for track of the type described, consisting of a length of belt provided with thickened ends and having suitably spaced holes for receiving the fixing means of the driving, guiding and tread elements.
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8. Track for endless track vehicles, substantially as described or substantially as shown in the accompanying
95 drawing.

Dated this 21st day of August, 1933.

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Fig. 1.

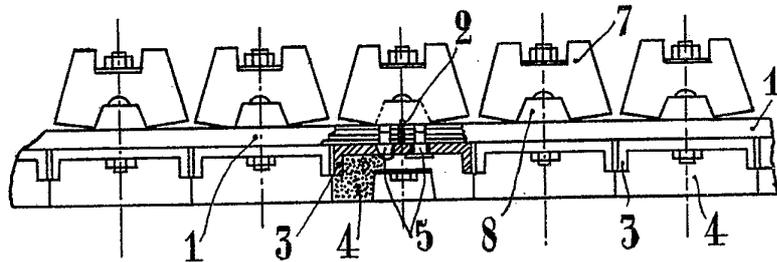


Fig. 2.

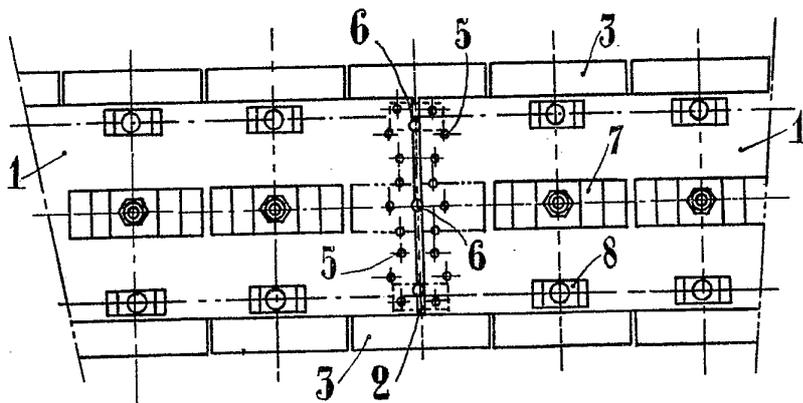


Fig. 3.

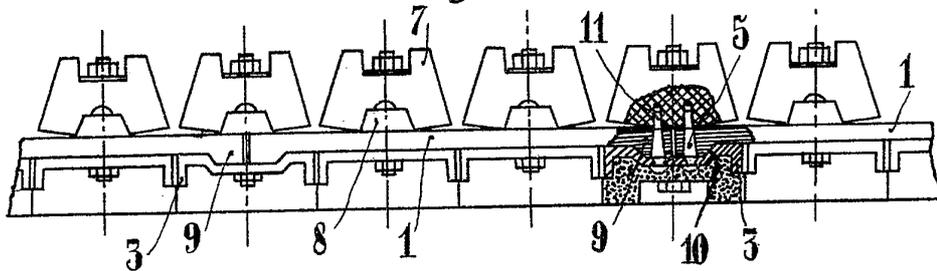
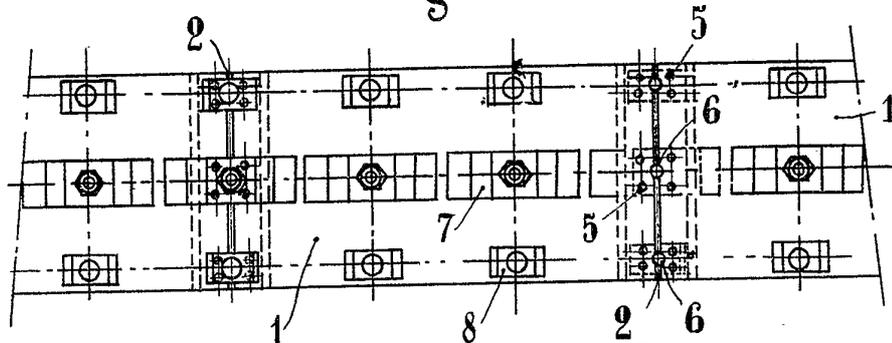


Fig. 4.



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