United States Patent

[11] 3,539,230

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[54] **ENDLESS TRACKS FOR TRACED VEHICLE**
6 Claims, 12 Drawing Figs.

[52] **U.S. Cl.** **305/38,** 305/56
[51] **Int. Cl.** **B62d 55/20**
[50] **Field of Search** 305/35, 36, 38, 56

[56] **References Cited**

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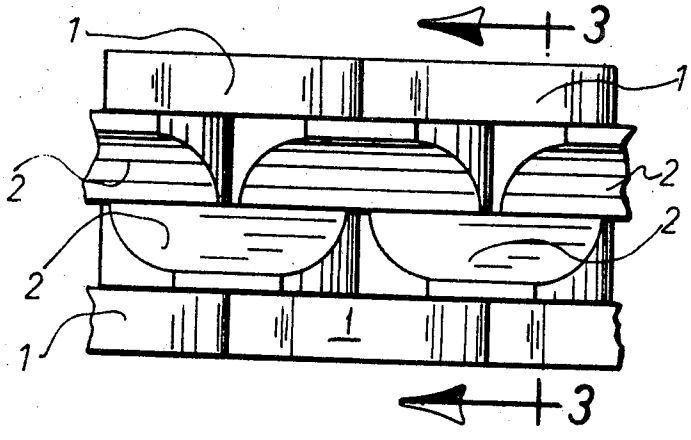
Primary Examiner—Richard J. Johnson
Attorney—Pierre Lesperance

ABSTRACT: A track for a tracked vehicle having series of ground-engaging elements set longitudinally in a plurality of adjacent rows, said ground-engaging elements being either driving or wheel guide elements, the elements of any one row being staggered relative to the elements of the adjacent row or rows, said ground-engaging elements being articulated by transverse rod arrangements and said wheel guide elements being provided with longitudinal guiding ridges having a transversely curved surface adapted to define a smooth gradual clearance between the curved surface and cooperating wheels of the tracked vehicle.



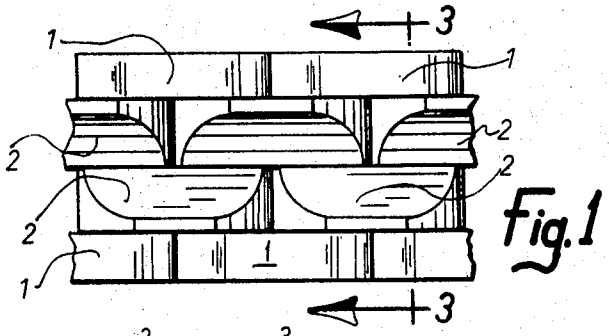


Fig. 1

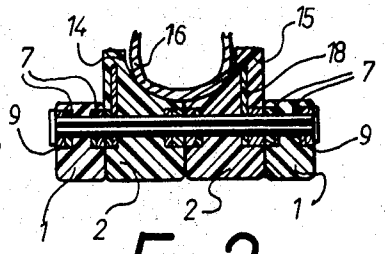


Fig. 3

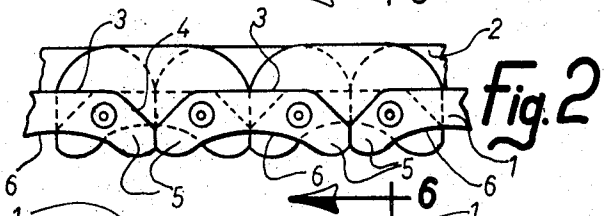


Fig. 2

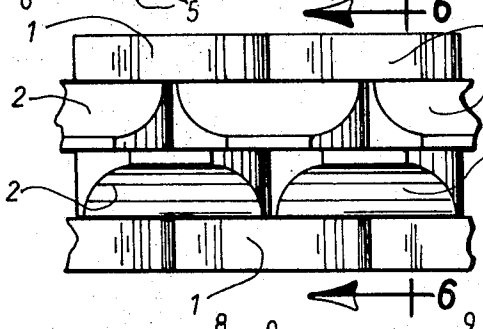


Fig. 4

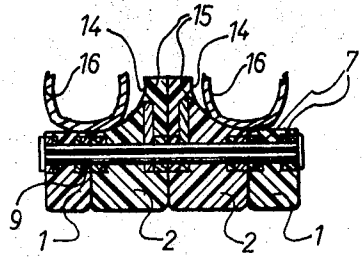


Fig. 6

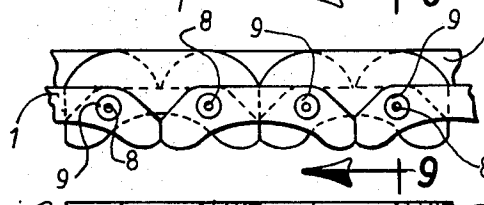


Fig. 5

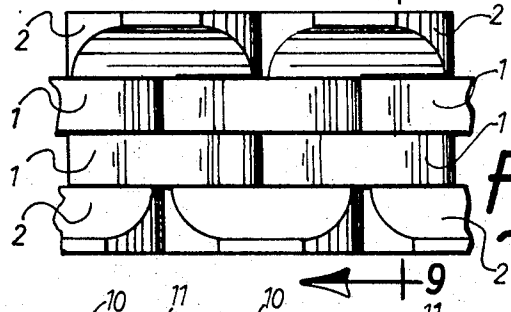


Fig. 7

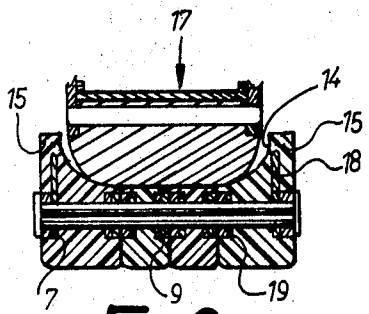


Fig. 9

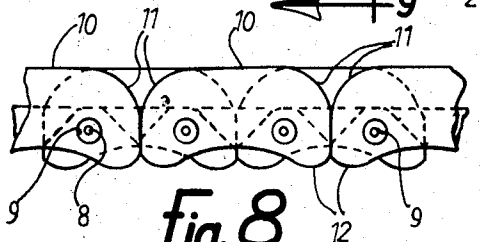


Fig. 8

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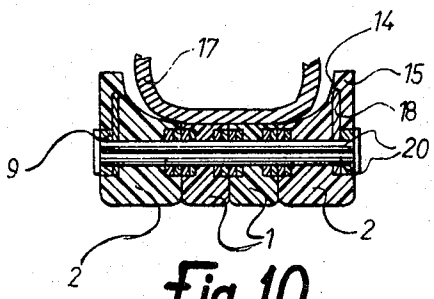

Fig. 10

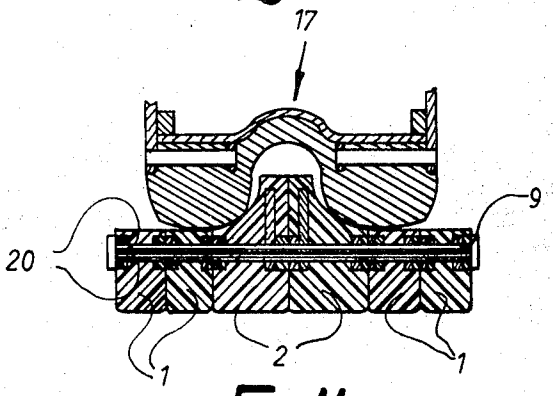

Fig. 11

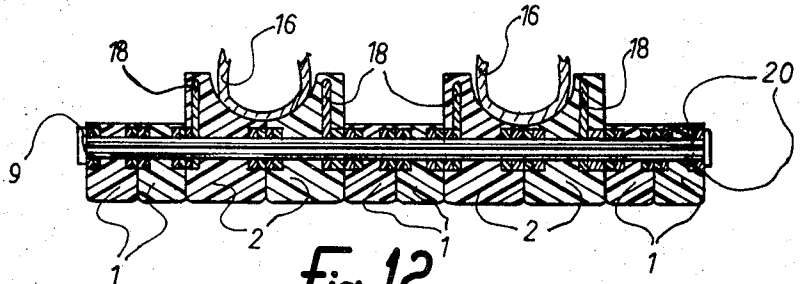

Fig. 12

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ENDLESS TRACKS FOR TRACED VEHICLE

The present invention relates to endless tracks for tracked vehicles and more particularly to an endless track assembly comprising a plurality of articulated ground-engaging elements including wheel guide elements.

An object of the invention is to provide improved vehicle tracks of simple design, manufacture and assembly.

An important object of the invention is to provide vehicle tracks comprising an assembly of a plurality of ground-engaging elements wherein some of said elements are provided with projecting lugs adapted to laterally restrain the track relative to wheels riding thereon.

A more specific object of the invention is to provide wheel guide elements adapted to keep a vehicle track aligned and having a gradual curve adapted to produce a minimum of friction between wheels on the vehicle and the wheel guide elements of the tracks.

Another object of the invention is to provide vehicle tracks constituting assemblies of pivotally connected ground-engaging elements of two types only.

Another object of the invention is to provide wheel guide elements and driving elements adapted to be assembled in a plurality of ways, whereby to accommodate wheels of various types and width.

The present invention defines track arrangements for vehicles constructed with series of ground-engaging elements set longitudinally in a plurality of adjacent rows wherein the elements of any one row are staggered longitudinally with respect to the elements of the adjacent row or rows.

The invention is fully disclosed by way of examples in the following description and the accompanying drawings, in which:

FIG. **1** is a top view of the bottom lay of one embodiment of endless track according to the invention;

FIG. **2** is an elevation view of the track shown in FIG. **1**;

FIG. **3** is a transverse cross-sectional view, in elevation, as seen along line **3–3** of FIG. **1**, with a tire in operative association thereto;

FIG. **4** is a top view of the bottom lay of another embodiment of the invention;

FIG. **5** is an elevation view of the track shown in FIG. **4**;

FIG. **6** is a cross-sectional view in elevation, as seen along line **6–6** of FIG. **4**, with dual tires in operative association thereto;

FIG. **7** is a view similar to views **1** and **4**, showing a further embodiment of the invention;

FIG. **8** is an elevation view of the track shown in FIG. **7**;

FIG. **9** is a cross-sectional elevation view, as seen along line **9–9** of FIG. **7**, with a wide tread or drum wheel tire operatively associated thereto;

FIG. **10** is a cross-sectional elevation view, as in FIG. **9**, but showing an air roll or wide tread tire;

FIG. **11** is a view similar to FIGS. **3**, **6**, **9**, and **10** but showing a drum wheel operatively associated with the track; and

FIG. **12** shows a section through a track assembly for a wide track dual wheel tire.

Reference to these views will now be made by use of like reference characters which are employed to designate corresponding parts throughout.

Essentially, the tracks subject to this invention comprise only two ground-engaging elements, a driving element **1** and a wheel guide element **2**.

The driving element **1** comprises a block of rubber, plastic or the like material having a flat surface **3** and 45° cuts **4** extending at each end of flat surface **3** in order to make room for travel of the track and of the driving elements **1** around sprockets provided for carrying and driving of the endless tracks.

The lower face of each driving element **1** is provided with a traction lug **5** at each end of said driving element. A concave surface **6** separates the end traction lugs **5** and determines therewith an efficient ground traction contour. Each driving element **1** comprises a pair of inserts **7** disposed longitudinally of the element and completely embedded in the driving element **1**. Inserts **7** are of metal or any other rigid material.

A pair of transversal holes **8** are provided through the driving element **1** and the insert or inserts **7**, for a purpose better defined in detail later.

A metallic washer element **9** is provided and recessed in an annular space surrounding the end of each hole **8**.

The wheel guide element **2** is of a somewhat more complex shape, as can be seen from the various FIGS. of the drawings. Wheel guide element **2** has substantially parallel lateral sides and a flat top surface **10** terminated at both ends by curved surfaces **11** in order to allow pivoting of the adjacent wheel guide elements **2** relative to each other around the sprockets carrying the endless track. The ground-engaging lower portion of the wheel guide element **2** has a contour similar to the contour of the corresponding portion of the driving element **1**; that is, the lower face of each wheel guide element **2** is provided with a traction lug **12** at each end thereof and a longitudinally concave surface **13** separates the end traction lugs **12** and determines therewith an efficient ground traction contour. The upper surface of each wheel guide element **2** is formed with a transversely concave and inclined curve **14** defining a transversely arcuate longitudinally extending guide ridge **15** disposed along one side of the element **2**. The concave and inclined curve wheel guiding surface **14** meets the crest of ridge **15** at an acute angle and joins with the other parallel side of the element **2** at substantially right angle to said other side. The curve of guiding surface **14** is made purposely gradual and of a substantially large radius to accommodate all known types of tires and wheel arrangements adapted to be used in connection with tracked vehicles.

The curved **14** gradually moves away from contact with the outside surface of the tire cooperating therewith, thereby reducing the friction between the track and the tire running thereon.

As can be seen in FIGS. **3**, **6**, and **9** to **12** inclusive, the clearance between the tire **16** or **17** and the track gradually increases from the tread portion to the sidewall portion of the tire. The wheel guide element **2** is also constructed of rubber, plastic or the like material and is reinforced by metallic inserts **18** and **19** embedded longitudinally therein.

It is to be noted that insert **18** is substantially larger than insert **19** and extends upwardly and longitudinally in guide ridge **15** to impart transverse rigidity thereto. Any person skilled in the art will readily appreciate that inserts **7**, **18**, and **19** can be made of any rigid, or substantially rigid material, including wood and appropriate plastics.

As mentioned earlier, the driving elements and the wheel guide element **2** are arranged in adjacent rows wherein the elements of any one row are staggered longitudinally relative to the elements of the adjacent row or rows, as best illustrated in FIGS. **1**, **4**, and **7**.

The ground-engaging elements **1** and **2** are articulated by transverse rod arrangements as defined in detail in copending U.S. Pat. application No. 769,224, filed Oct. 21, 1968, now U.S. Pat. No. 3,531,165, entitled: "ANTIFRICTION PIVOTAL CONNECTION FOR ELEMENTS UNDER TENSION".

The articulation defined in the above-mentioned patent application basically comprises three parallel transverse rods **20** pivotally mounted in contacting association to each other whereby pivoting of the ground-engaging elements **1** and **2** will cause rotation of the transverse rods **20**. It should be appreciated that pivoting between the ground-engaging elements could be obtained by various well known ways, such as by a single pivot extending transversely through each hole **8**.

As stated hereinbefore, the ground-engaging elements are adapted to be assembled in a plurality of ways to accommodate wheels of various types and widths. For example, FIGS. **1**, **2**, and **3** show an embodiment of the invention wherein the vehicle track is adapted to cooperate with a single wheel. As is shown more particularly in FIG. **3**, a pair of adjacent rows of wheel guide elements **2** are aligned with the

curved surface **14** facing each other and a row of driving elements **1** is aligned adjacent each side of said pair of adjacent rows.

In FIGS. **4**, **5**, and **6**, particularly in FIG. **6**, is shown an arrangement adapted for use with regular dual wheels. This arrangement is different from the FIG. **3**, or single wheel arrangement, by the fact that the wheel guide elements **2** have their curved surfaces **14** facing away from each other.

FIGS. **7**, **8**, **9**, and **10** show an arrangement adapted to be used with a drum wheel, an air roll and, generally, wide tire types of wheels. The extra width of the wheel or tire compared to the single wheel, is provided by the rows of driving elements being inserted between the two rows of wheel guide elements **2** instead of outside, as in FIG. **3**.

FIG. **11** shows a wide track arrangement adapted for a wide drum wheel arrangement and FIG. **12** illustrates a further possibility, this time, for widely spaced dual wheels.

It will be understood that a large number of different embodiments is possible. Also, the width of the ground-engaging elements could be varied at will to suit any particular application.

From the various embodiments of the invention illustrated and described, it will be understood that other embodiments and various alterations in the details of construction may be made without departing from the scope of the invention, as indicated by the appended claims.

I claim:

1. A track arrangement for a wheeled vehicle comprising: a plurality of interarticulated ground-engaging elements set longitudinally in a plurality of adjacent rows, the ground-engaging elements of any one row being staggered longitudinally with respect to the ground-engaging elements of any immediately adjacent row, said ground-engaging elements being elongated blocks having a pair of parallel lateral sides and a bottom ground-engaging surface; and a ridge extending along one side of at least some of said ground-engaging elements in a direction opposite to said bottom ground-engaging surface, the ground-engaging elements provided with said ridge defining an inclined guiding surface extending between the crest of said ridge and the other side of said pair of lateral sides, said inclined guiding surface sloping towards the vehicle wheels such as to cooperate therewith to cause substantially frictionless lateral guidance of the track arrangement relative to the wheels.

2. A track arrangement as claimed in claim **1**, wherein a number of said ground-engaging elements form driving elements and the remaining ground-engaging elements form wheel guide elements, only the wheel guide elements being provided with said ridges and inclined guiding surface.

3. A track arrangement as claimed in claim **1**, wherein the portion of said inclined guiding surface joining with the other side of said pair of parallel lateral sides, meets said other side at substantially 90°.

4. A vehicle track arrangement as claimed in claim **1**, wherein said inclined guiding surface has a transverse curve determining a gradually increasing clearance between said inclined guiding surface and the adjacent side of said wheels.

5. A track for a wheeled vehicle as claimed in claim **1**, wherein the ground-engaging elements are made of a material selected from rubber, plastic or the like, each of said ground-engaging elements having a reinforcing insert embedded therein, said reinforcing inserts extending into said ridges to provide transverse stiffness to the latter.

6. A vehicle track arrangement as claimed in claim **5**, wherein the elongated blocks forming the ground-engaging elements, are trimmed at the ends to allow said ground-engaging elements to travel in a curved path around sprockets adapted to drive said track arrangement.