A. BROSIUS.

Endless Track-Wheel for Vehicles.

No. 209,451. Patented Oct. 29, 1878.

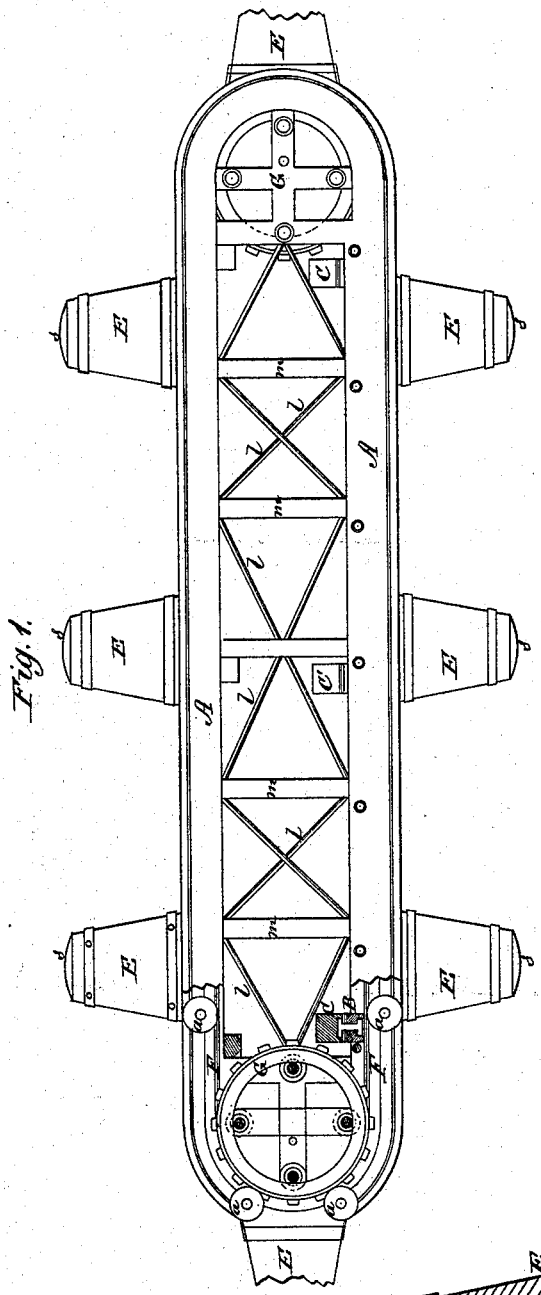

Fig. 1.

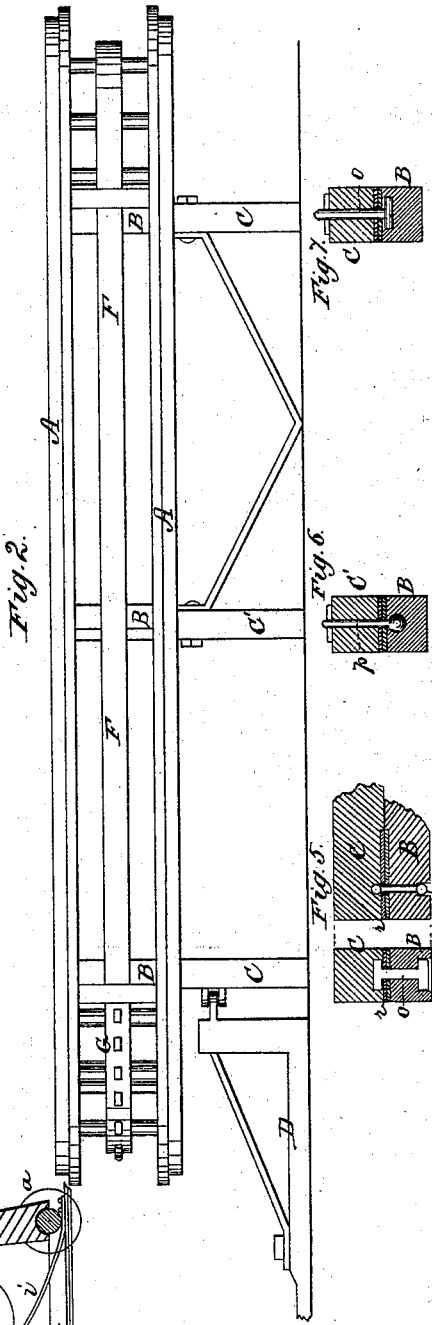

Fig. 2.

Fig. 7.

Fig. 6.

Fig. 5.

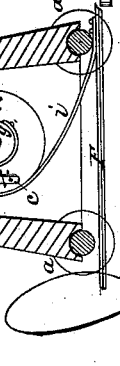

Fig. 4.

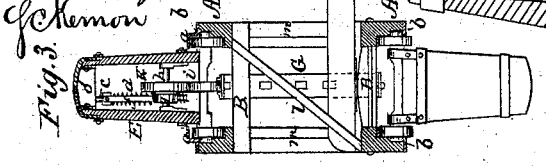

Fig. 3.

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AARON BROSIUS, OF FORT WAYNE, INDIANA.

IMPROVEMENT IN ENDLESS-TRACK WHEELS FOR VEHICLES.

Specification forming part of Letters Patent No. **209,451**, dated October 29, 1878; application filed March 15, 1878.

To all whom it may concern:

Be it known that I, AARON BROSIUS, of Fort Wayne, in the county of Allen and State of Indiana, have invented a new and useful Improvement in Vehicles; and I do hereby declare that the following is a full, clear, and exact description of the same.

The object of the invention is to effect an improvement in the class of vehicles formed of endless oval or elliptical frames or tracks and flexibly-connected trucks traveling around said tracks. Vehicles of this class are especially adapted for use in localities where the soil is soft and the roads liable to be muddy or sandy, since the trucks are not caused to move or advance like an ordinary carriage-wheel through the stratum of soil, in which they become more or less embedded when supporting the weight of the vehicle, but are successively lifted out of the soil and carried around over the body of the elliptical track as the vehicle advances.

The improvement relates, first, to a yielding or elastic connection between the frame and the rests or standards upon which the vehicle is supported while traveling; second, to a flexible connection between the pairs of elliptical frames; third, to the construction of the rests or hollow pedestals on which the vehicle is supported and on which it travels, as hereinafter described.

In the accompanying drawing, forming part of this specification, Figure 1 is a side elevation of the vehicle with a portion broken away. Fig. 2 is a plan view of half of the vehicle, the rests or bearing-blocks being detached. Fig. 3 is a vertical section of one side of the vehicle. Fig. 4 is a vertical section of one of the rests or bearing-blocks. Figs. 5, 6, 7 are detail cross-sections, showing the pivot connection between the elliptical frames and the cross-bars.

The frame or body of the vehicle is formed of two pairs of endless oval or elliptical frames the frames forming each pair being rigidly connected by short cross-bars, B, and the two pairs A A A A being flexibly connected by long cross-bars, C, in such manner that the pairs of frames are maintained the same distance apart and parallel to the same plane, but are yet allowed independent motion vertically, as will be more fully explained hereinafter.

A pole or tongue, D, is jointed to the front one of the main cross-bars between the pairs of elliptical frames for the purpose of attaching horses or other draft-animals for hauling the vehicle; but I shall, of course, employ a mechanical propeller or motor instead when conditions permit or require.

The main bars A of the oval frames are rabbeted on their inner opposite sides, to receive the friction-wheels *a* of the axles or trucks to which the rests or standards E are attached. Angular flanges or bands *b* are attached to the outer sides of each of said bars, their inwardly-projecting portions forming one side of the grooves or ways in which the wheels travel, as clearly shown in Fig. 3. The rests or standards have an elastic or yielding connection with the belt F, which travels between the frames A on the large wheels G, located near and concentric with the circular ends of the frames A. Important results are attained by this elastic connection. The chief obstacle to the practical success of this class of vehicles heretofore has been the too rigid or unyielding connection between the rests or trucks and the traveling chain, so that if the rest at the forward end of the vehicle encountered an elevation or any obstacle raised considerably above the general grade the connection between the chain and rests or trucks was liable to be suddenly broken. Besides this the vehicle was subject to a succession of violent shocks. My plan is to connect the rests with a traveling belt, so that the rests will yield slightly when they come in contact with the ground, and thus avoid injury and other undesirable results.

The means I employ consist, Figs. 3, 4, of a rod, *c*, which is permanently attached to the end of the hollow rest E within the latter; a spiral spring, *d*, encircling said rod *c*, and attached to the lower end of the rod and to a ring, *e*, sliding therein; a belt, *f*, attached to the aforesaid sliding ring *e* and to a small pulley, *g*, on shaft *h*, and a second belt, *i*, attached to a larger pulley, *k*, fast on the same shaft alongside the small pulley, *g*, and also attached to the main traveling belt F.

It will be seen that when one of the rests E passes around the front end of the oval frames A A and comes in contact with a stone or an elevated portion of the roadway, in place of a violent shock being imparted to the vehicle, or the connection between the rest and belt being broken, the spring *d* will yield to an extent corresponding to the force of the impact, and allow the rest a momentary pause while the belt F moves on.

The particular operation of the devices composing the elastic connection is as follows: The contact of the end of the rest E with the road-bed tends to arrest its movement around the elliptical frames A A, while the latter tend to continue their forward movement. This will obviously create a tension on the main traveling belt F, which will be in part relieved by the belt *i* rotating the pulley *k* and shaft *h*, and thereby causing the other belt, *f*, to be wound on the small pulley, *g*, and compress the spiral spring *d* correspondingly by drawing the ring *e* down on the bar *c*. The tension of the spring *d* is, however, quickly relieved as the frame of the vehicle moves forward, and its elasticity tends to draw the rest E back to its normal position with relation to the traveling belt F. The elastic connection is equally important in facilitating the passage of the rests around the rear end of the frames. The bars of the elliptical frames are connected and braced by inclined rods *l* and vertical thrust and tension bars or rods *m*, so that each frame is in the nature of a separate truss, yet, being connected, they form a double truss. I thus produce a frame having maximum strength combined with minimum weight of parts.

The elliptical frames A are preferably made convex on the under side to facilitate turning the vehicle about, for it is obvious that this would be difficult or impracticable if the weight of the vehicle could not be supported on a single pair of rests. By the convex construction of frame this can be effected, and hence the vehicle can be easily turned. The connection between the pairs of frames A A, whereby they are held rigidly parallel, and yet have independent movement in vertical planes, is formed by the long end cross-bars, C, and middle cross-bar, C′, and the pivot-bolts *o* and *p*. The heads of the H-shaped pivots *o*, which connect the end bars, C, to the frames A, are arranged crosswise of said bars. The heads of pivots *p* are of spherical shape. A metal plate, *r*, is attached to the under side of bars C C′ and upper side of bar B. The shanks of the pivots *o* and *p* pass through these plates, as shown, and connect the bars C C′ and B together.

By this arrangement the ends of the frames may rise and fall independently, corresponding to the undulations or unevenness of the road-bed, while the middle bolts, *p*, permit the frames to oscillate freely thereon without up-and-down movement of the same at the point of connection. To facilitate the up-and-down movement of the ends of the frames, the short end cross-bars, Fig. 3, are arched or made convex, thus forming a suitable bearing for the long cross-bars. The middle cross-bars are straight or flat on the upper side. The rests E are hollow tapered cylinders, preferably formed of wood, and having metal caps *s* to take the wear.

This construction combines the essential qualities of strength, lightness, and durability in a high degree.

What I claim is—

1. In a vehicle of the class herein described, a series of traveling rests, the elliptical frames, and a traveling belt, said rests and belt having an elastic or yielding connection, combined substantially as and for the purpose specified.

2. The combination of the hollow rests, the rod, spring, belts, pulleys, and shaft with the main traveling belt and elliptical frames, as shown and described.

3. The combination of the long end cross-bars and T-headed fastening-bolts with the short cross-bars and elliptical frames, substantially as and for the purpose specified.

4. The combination of the middle cross-bar, the end cross-bars, and the respective fastening-bolts with the frames and short cross-bars, the heads of the bolts of the middle and end bars being arranged, respectively, lengthwise and transversely of the cross-bars, as and for the purpose specified.

5. The hollow tapered wooden rests, having the metal caps or heads secured to the body of the same, as shown and described.

The above specification of my invention signed by me this 12th day of March, 1878.

AARON BROSIUS.

Witnesses:

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CHAS. A. PETTIT.