April 5, 1932. E. J. WILSON 1,852,197

TRACTION MECHANISM

Original Filed Dec. 17, 1924

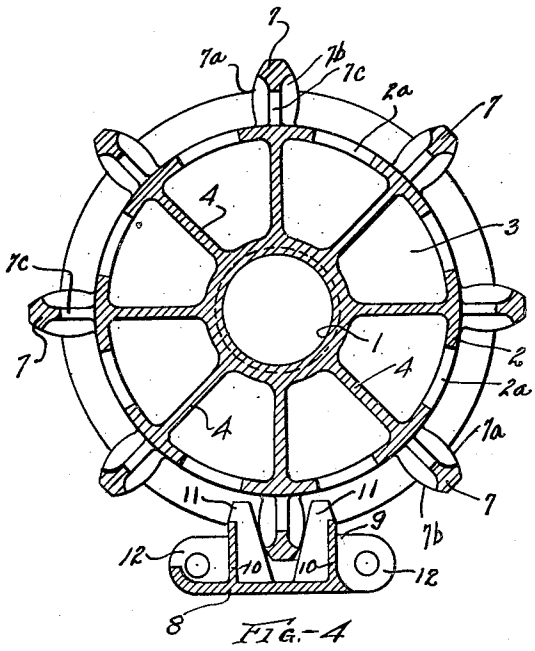


FIG. -4

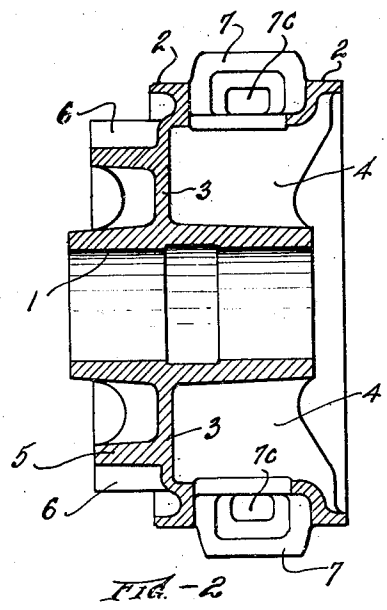


FIG. -2

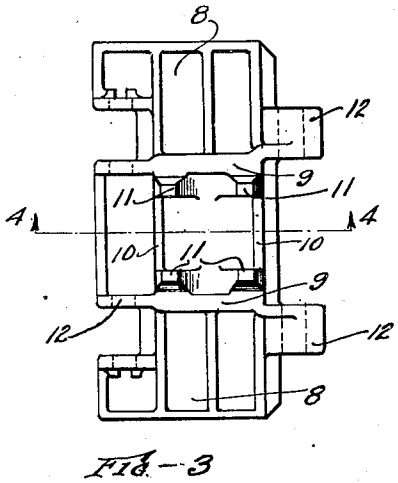


FIG. -3

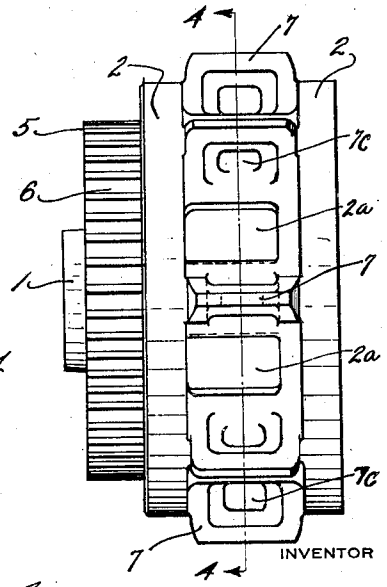


FIG. -1

INVENTOR

Emery J. Wilson

BY Brockett & Hyde

ATTORNEYS

Patented Apr. 5, 1932 1,852,197

UNITED STATES PATENT OFFICE

EMERY J. WILSON, OF CLEVELAND, OHIO, ASSIGNOR TO THE THEW SHOVEL COMPANY, OF LORAIN, OHIO, A CORPORATION OF OHIO

TRACTION MECHANISM

Original application filed December 17, 1924, Serial No. 756,484. Divided and this application filed July 7, 1928. Serial No. 290,914.

This invention relates to traction mechanism for vehicles of the continuous tread type, and more particularly to the driving rollers employed therein for cooperation with the tread, and this case is a division of my application, Serial No. 756,484, filed December 17, 1924.

In such types of vehicles, as has been described in the original application above identified, the form and design of the driving rollers and of the tread shoes cooperative therewith is an important factor. In traveling over roadways one shoe may have to support, momentarily at least, one half the weight of the machine. The assumption that a multiplicity of small supporting rollers tends to distribute the load over a corresponding number of shoes is erroneous as roadways are never level or smooth enough to produce this effect even though the rollers are placed in perfect vertical alignment on the truck. Abilty to travel without damage to the road, therefore, depends upon the amount of bearing surface existing in the individual shoe, and not upon the total bearing surface of the assembled tread. Furthermore, as an extreme working condition the machine may have to lift its maximum load crosswise over one tread with only one shoe of this tread resting on a solid foundation. In this case the entire weight of the machine plus its tipping load may come on this shoe. The foundation may be such that this shoe is supported only at its ends, or only at its center. By providing the shoe with two rail surfaces properly spaced apart, and the supporting rollers with correspondingly spaced rolling surfaces, the bending stresses in the shoe are equalized for the two extreme conditions of support; also the stability base for the truck is increased since tipping of the machine must occur over the outer rails of the shoes.

An object of my invention is to provide an improved form of contact between driving roller and continuous tread, and my invention embraces providing spaced rolling surface with teeth therebetween and on the same pitch line therewith.

However, where the roller is thus formed with such pair of spaced rolling surfaces, on the pitch line of the teeth therebetween, some provision is required for disposing of dirt picked up by the traction mechanism and lodged between the roller teeth. Another object of the invention, therefore, is to prevent the treads and rollers from becoming clogged by dirt and the like, by providing suitable openings in the rollers including the teeth thereof for the dirt to pass through, and a suitable self-cleaning tooth action between rollers and treads.

These and other objects, and the invention itself will be more clearly understood from the following detailed description with reference to the accompanying drawings in which Fig. 1 is an elevation of a traction wheel in which my invention is incorporated; Fig. 2 is a section through the same in a plane passing through the axis thereof; Fig. 3 is a plan view of one of the tread links; and Fig. 4 is a transverse sectional view of the parts shown in Figs. 1–3 showing these parts in interengaging relation, Fig. 4 being taken as in the planes of lines 4—4 of Figs. 1 and 3.

It will be understood as described in my above identified original application, that the driving rollers serve to support and propel the vehicle frame upon the continuous tread. The driving rollers are similar and as indicated in the drawings each is formed preferably as an integral casting having a hollow hub portion 1 for a running fit upon an axle of the vehicle.

The roller has a circular rim portion 2 which extends around the hub in spaced relation therewith. A wall 3 connects one side of the rim with the hub. Radially extending ribs 4 connect the rim with the hub and are integrally connected at one end with the exterior side of the wall 3. An annular flange 5 extends from the interior of the wall 3, and the periphery thereof is provided with gear teeth 6.

The central portion of the rim 2 is depressed and teeth 7 extend thereacross and project above the periphery of the rim 2. The front and rear portions 7*a* and 7*b* of these teeth provide driving faces for propelling the vehicle. The outer surface of the rim on each side of the teeth provides the bearing sur-

face for supporting the weight of the vehicle frame. The driving faces 7*a* and 7*b* of the teeth curve in opposite directions, being formed on a pitch line concentric with the outer surface of the rims 2 and preferably with their addenda and dedenda substantially equal above and below the pitch line.

The teeth 7 are formed with apertures 7*c* extending centrally through the dedenda thereof. These apertures provide a clearance for dirt, mud, stones and other foreign substances of similar nature with which the driving roller teeth must contend in consequence of their position adjacent the ground. The rim 2 intermediate the teeth is provided with apertures 2*a* to permit such foreign substances to pass interiorly so that the space intermediate the teeth will not become clogged.

It will be seen that the described apertures in the driving roller will provide a light structure as well as one which will readily be cleaned of foreign substances. It will also be observed that the teeth 7 are formed so that the ribs 4 are in alignment therewith, such arrangement adding rigidity and strength.

An articulated continuous tread is provided for cooperation with the driving rollers. The tread is composed of a plurality of similar traction shoe members having their adjacent ends pivotally secured together, one of these shoe members being shown in the drawings. Each tread shoe is preferably formed as an integral casting and includes a rectangular shaped ground engaging tread portion 8 having a pair of parallel and transversely spaced rail members 9 extending from the upper side thereof, the tops of such rails providing a bearing surface for supporting the rollers by engagement with the rim surfaces 2 thereof. Between the longitudinally extending rail members are a pair of longitudinally spaced web members 10 upstanding from the tread portion 8. Teeth 11 are arranged at the corners formed by the rail members 9 and the web members 10 joined with and extending above the same whereby the members are reinforced by the teeth and the tread portion is reinforced by the members. The teeth 11 are formed from a pitch line which is in substantially a horizontal plane with the bearing surfaces of the adjacent rail members 9, and preferably their addenda and dedenda extend substantially equally above and below the rail plane.

The ends of the shoe are provided with bearings 12 which are slotted so that they will form a rabbeted assembly with adjacent shoe members and may be secured together endwise by pintle pins.

The teeth 11 of the tread member are transversely spaced correspondingly with the working face portions of the teeth 7 of the roller, so that the clearance between opposite pairs of teeth 11 is substantially equal to the width of the opening 7*c* of the teeth 7.

It will be apparent from Fig. 4 that the webs 10 are set back from the working faces of the teeth 11 so that a substantial clearance is had between the webs 10 and the tooth 7 of the roller which may be engaged between the teeth 11. Thus ample space is allowed for any foreign material accumulated by either the roller or the tread, which foreign material, therefore, will substantially clear the working faces of the parts during their operation but will be worked loose thereby.

Of course, the tread being endless will tend to clear itself of such foreign material during its position in the cycle along its upper stretch, whence material dropped onto the roller may find its way through the openings 2*a* and out longitudinally of the roller axis.

The advantage by such arrangement will increase the life of the tread, and will require a minimum amount of power to propel the vehicle. The teeth of the driving rollers and rails are so formed as to have all the characteristics of engaging standard pinion and rack teeth with such definite and well-known curvatures for their faces and flanks so as to secure the benefits of a rolling efficient engagement between the faces as would be had in the case of gear teeth of standard form engaging the teeth of a standard track.

What I claim is:

A driving wheel for continuous tread vehicles, having its peripheral portion formed to provide an annular groove between a pair of spaced tread portions, with teeth spaced about the wheel on a pitch line defined by the tread portions, each tooth extending laterally between said tread portions, and outwardly from the bottom of said groove and beyond said tread portions, whereby pockets are formed about the wheel between adjacent teeth, said teeth having through openings between their driving faces to provide passage ways between pockets for accumulations upon the peripheral portion of said wheel.

In testimony whereof I hereby affix my signature.

EMERY J. WILSON.