Oct. 28, 1924. 1,513,459

G. C. JETT

TRACTION BELT AND SPROCKET WHEEL

Filed July 9, 1919 2 Sheets-Sheet 1

Fig. 1.

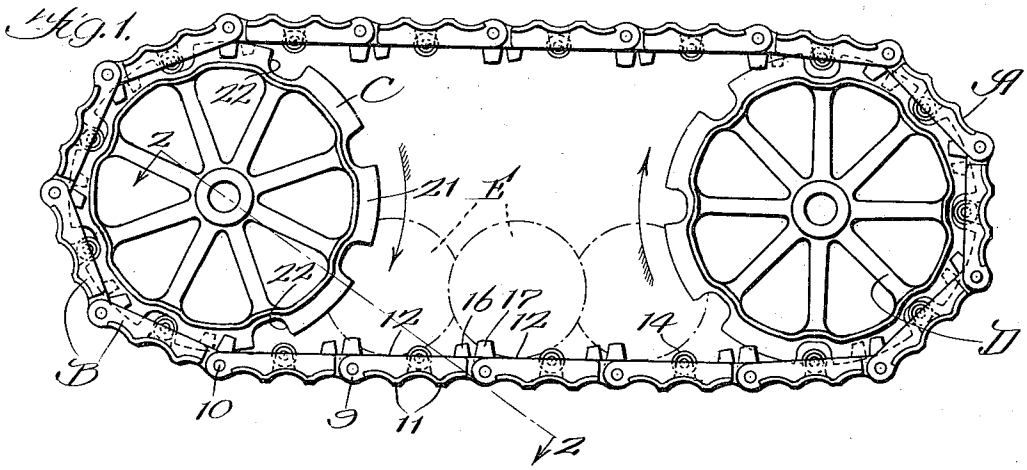
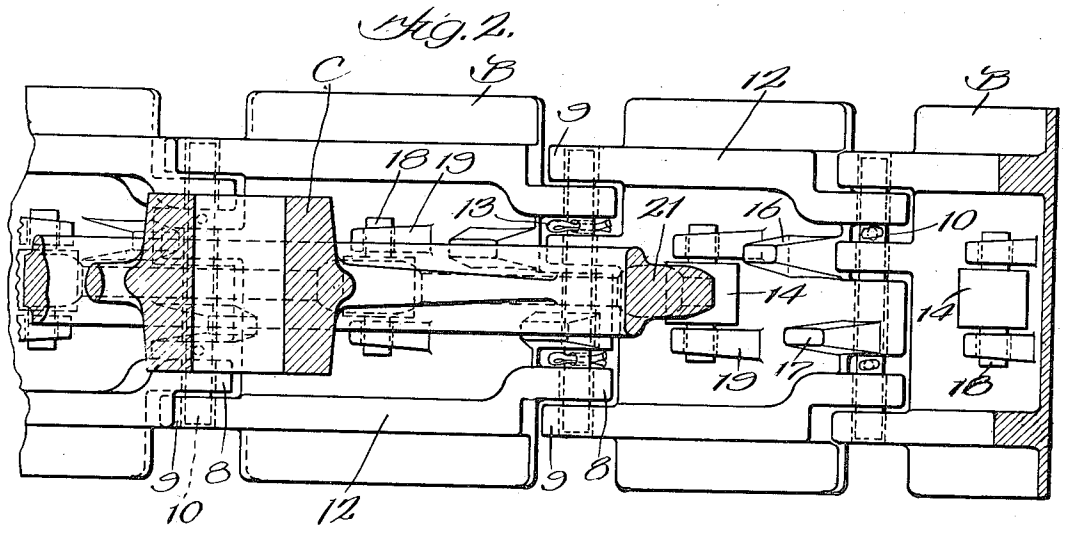



Fig. 2.




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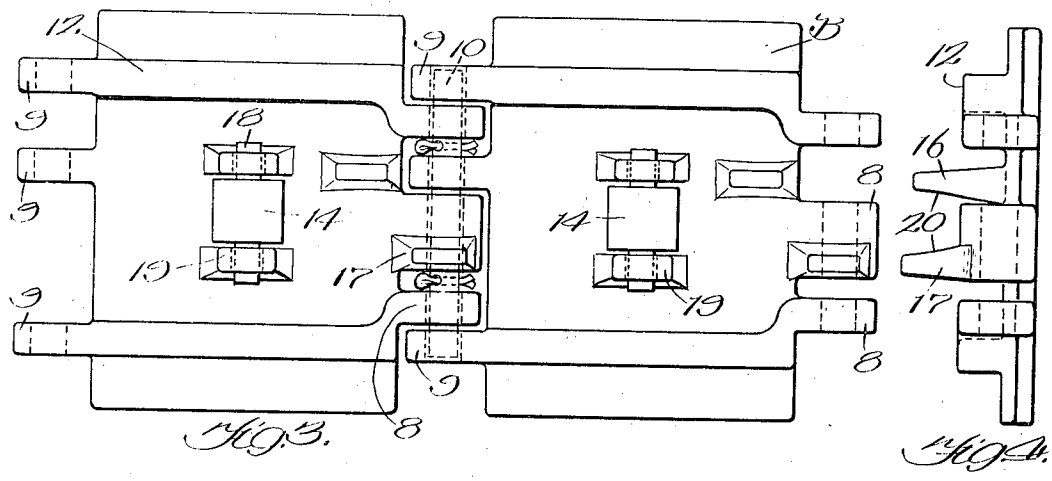



Fig. 3. Fig. 4.

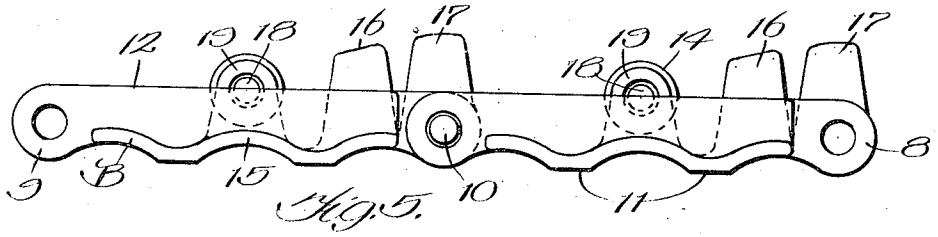



Fig. 5.

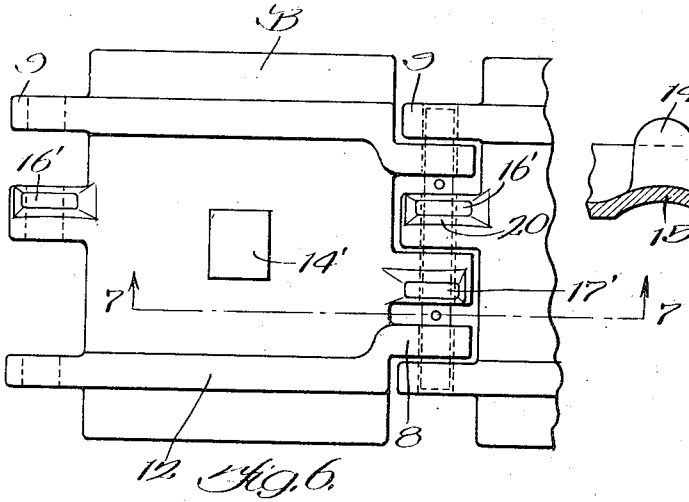



Fig. 6.

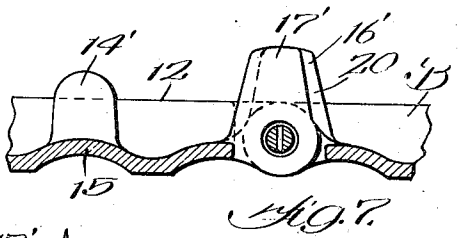



Fig. 7.

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# UNITED STATES PATENT OFFICE.

GEORGE C. JETT, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF TWO-FIFTHS TO WALTER H. STIEMKE, OF MILWAUKEE, WISCONSIN.

## TRACTION BELT AND SPROCKET WHEEL.

Application filed July 9, 1919. Serial No. 309,576.

*To all whom it may concern:*

Be it known that I, GEORGE C. JETT, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Traction Belts and Sprocket Wheels, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming a part of this specification.

My present invention relates in general to traction devices commonly used in connection with crawler tractors, generally at each side thereof, and has reference more particularly to traction belts and sprockets, components of such traction devices, one object of the invention being to improve the construction and increase the efficiency and durability of devices of this character.

Traction belts, as generally employed in the art, are composed of an endless series of track shoes, each terminally provided with hinge elements, connected to the adjacent ends of its adjoining shoes by means of pintles engaged in said hinge elements. Heretofore it has been proposed to employ draft elements disposed about or in contiguity with the pintles of such belt and with which the draft sprocket teeth were to be engaged, said draft elements either having a roller characteristic or being possessed of a rounded contour. A construction of this sort has many disadvantages due to this stated positioning of the draft elements, the principal among them being the great shoe depth necessarily required, which in turn involves great weight and a maximum of metal, a deep box between the shoe rails inviting clogging by dirt, the maximum of stress on pintles, a waste of power, and the employment of notches at the joints thus requiring the provision of some means for guarding the pintles against the action of dirt and stones encountered by the belt in its travel.

Another object of my invention is to produce a tread shoe wherein these disadvantages are positively eliminated. In this connection I contemplate freeing the hinge joint of draft rollers and thereby achieve a shallow shoe wherein a draft roller is located intermediate the joints in each shoe. In this way the pintle is freed so as to provide a full bearing for the shoe hinge elements, and the latter are arranged to form a part of the ground gripping elements of the shoe.

A further object is to provide a shoe which requires no machining after leaving the foundry, thereby permitting it to be made of the hardest steel, as manganese steel, and which being shallow has a favorable economical characteristic. A still further object is to provide the shoe with sprocket guiding means co-operating with the draft element, the shoe, as thus constructed, providing twice the number of contact points with the sprocket periphery than the number of teeth or driving faces possessed by the sprocket, while maintaining maximum shoe length. This approaches the ideal condition in a traction device of this type.

The invention further contemplates the provision of novel details of construction, combination and arrangement of shoe and sprocket parts, whereby certain other important advantages are attained, as will be hereinafter described, or are incident to my invention.

These objects and advantages I attain by means of a construction illustrated in preferred form in the accompanying drawings, wherein:

Figure 1 is a side elevation of a traction belt and its sprockets constructed in accordance with my invention;

Figure 2 represents an enlarged sectional view taken along the line 2—2 of Figure 1;

Figures 3, 4 and 5 are respectively views in top plan, end elevation and side elevation of the tread shoes composing the belt;

Figure 6 is a top plan view of a modification of the tread shoe; and,

Figure 7 is a partial section thereof taken along the line 7—7 of Figure 6

Referring to the drawings, it will be seen that the reference character A denotes the traction belt embodying an endless series of tread shoes B passed about a draft sprocket C and an idler sprocket D. The customary weight bearing wheels E are indicated in dotted lines as they themselves form no part of my present invention. These wheels transmit the weight of the tractor to the lower stretch of the belt, upon which they roll during tractor movement, and may, if desired, be arranged in the manner illustrated in my Reissue Letters Patent No.

13,634 of Oct. 21, 1913. It should be observed that the present invention is in the nature of an improvement upon the tread shoes and sprockets shown in this patent.

In the present instance the tread shoe B takes the form of a casting, preferably of manganese steel, the lower portion of which is sinuate in contour. One end is provided with hinge elements or tongues 8 which interfit with the adjoining tongues 9 of the next adjacent shoe, and are pivotally connected by the pintle 10 of relatively large diameter. The tongues and pintles are substantially co-extensive with the breadth of the shoe to afford a maximum bearing area, though sufficient spaces are left at intervals in the joint to confer upon the latter a self-clearing characteristic. The sinuations referred to above are indicated by the numeral 11 and they together with the lower portions of the hinge elements act as grousers or ground gripping lugs. Rising internally from these lugs are the rails 12 whose opposed tongue ends are stepped at the joints to provide a continuous track upon which the weight bearing wheels roll. The pintles are maintained against displacement by cotter pins 13 located in the joint intermediate the ends thereof.

Between the joints of each tread, and preferably centrally thereof, I provide an upstanding driven draft element which in the structure illustrated in Figures 1 to 5 inclusive takes the form of a roller 14 and in the modification of Figures 6 and 7 is shown as a boss 14′ rising integrally from the central ridge 15 and having a rounded or curved contour as indicated. In order to guide the shoes onto the sprocket and to maintain the rails 12 in aligned contact relation with the wheels E, staggered guide lugs 16 and 17 are provided in the vicinity of each joint and form an integral part of the shoe casting. In the modification these guide lugs 16′ and 17′ are located upon inner hinge elements at each end of the shoe so that when the shoes are coupled a pair of substantially confronting guide lugs are thus positioned at each joint intermediate the draft elements 14′.

Referring now more particularly to the guide lugs shown in Figures 1–5, it will be seen that the roller 14 and its journals 18 are integrally formed in this instance and I prefer that in molding the shoe casting the housings 19 be cast about the journals, the latter being shrouded with a coat of core sand or graphite to insure the necessary clearance. Such, as already inferred, represents the preferred roller and housing construction. It should be observed, however, that other means for mounting the roller may be invoked if desired. One important advantage of removing the roller from the shoe hinge resides in the fact that the roller bearings may be made in any desired size without trespassing upon or disturbing the valuable bearing area about the hinge pintle.

In each case the guide lugs at the joint have arcuate inner contact faces 20 which are spaced sufficiently apart to receive between them the sprocket tooth 21 and with whose side faces they have a guiding contact, while the driving face 22 of the tooth 21 is in driving contact with the roller immediately in advance of the joint. In other words, I aim to provide a traction belt embodying a sprocket having comparatively few teeth, together with shoes provided with sprocket guided means at the joints and intermediate draft elements driven by the teeth, the latter being elongated so that during sprocket rotation they extend into the clearance notch between the components of said means and thus insure twice the number of contact points, over that possible were these guide lugs omitted, thereby virtually imparting the benefit of a sprocket having twice the number of teeth over that actually existing to a given case, while maintaining a maximum length of shoe. This maintenance of maximum shoe length is important as buckling is prevented and the number of joints is reduced to the minimum. Stated differently, one in this way approaches very closely to if not actually realizes an ideal condition, namely, a large number of tread contacts with the sprocket and maximum shoe lengths.

Another important advantage resulting from this stated construction rests in the provision of a shallow box in the shoe, that is to say, by virtue of the central positioning of the upstanding draft roller the height of the rails 12 is reduced to the minimum. Being thus reduced a relatively small amount of dirt and stones is picked up in the box, and even at that whatever is the condition in this respect it can have no deterrent influence upon the upstanding roller, and practically none at the joint which is self-clearing. Likewise, since the guiding lugs are preferably in a staggered relation they provide an open side through which dirt may find a clear avenue of discharge. The draft roller also serves in its rotation to distribute wear evenly over its periphery. It will be noted that the height of the rails as shown approximates the distance from the plane of grousers to the axis of the roller, a favorable condition impossible to attain where rollers are employed at the joint, and obviously so inasmuch as the plane of the rails as the latter pass over the sprocket is not at right angles to a line drawn radially of the sprocket and then centrally through the roller, as is the case with the present invention, consequently the depth of the box or shoe is more than twice as great as that of

my shoe. Furthermore, the provision of guards for the pintles is absolutely unnecessary. Other advantages will be apparent to those skilled in the art.

I claim:

1. In combination, a sprocket wheel having driving draft elements and a plurality of tread shoes provided with a rail, end hinge elements located below the plane of the rail, a centrally located driven roller draft member and guiding lugs independent of said rail and of said member, and disposed between said rail and the centers of the shoes, extending upwardly beyond the plane of the rail and adapted to have engagement with side portions of said sprocket wheel.

2. As a new article of manufacture, a tread shoe casting provided with end hinge elements, a centrally located roller draft member, and a pair of laterally spaced guide lugs longitudinally staggered, whereby dirt will not accumulate therebetween, said lugs being provided with bearing surfaces adapted to interact with a member engaging said draft member.

3. A tread shoe embodying a transversely corrugated casing having hinge elements at its respective ends and provided with a centrally disposed driven draft element, the hinge elements having their axes substantially in a plane coincident with the convex surfaces of the corrugations on the inner side of the plate and said driving draft element being mounted upon one of said corrugations, whereby said driven draft element is protected against accumulations of foreign matter upon the shoe, which might otherwise be crowded against it by the driving sprocket.

4. In combination, a sprocket wheel having driving draft elements and a plurality of pivotally connected tread shoes each having a driven draft member and non-continuous guiding lugs detached from said driven draft member and disposed wholly at one side of said member in the line of movement of the shoe and adapted to have engagement with side portions of said sprocket wheel.

5. A tread shoe casting integrally provided with a rail and end hinge elements located below the rail plane, the web of the casting intermediate said hinge elements being transversely ridged and having a ridge portion thereof provided with a driven draft member extending upwardly past said rail and said end hinge elements.

6. A tread shoe provided with a rail remote from its center, end hinge elements, a driven draft member disposed intermediate said elements, and guiding lugs disposed more centrally of said shoe than said rail and extending upwardly beyond the plane of the rail.

7. A tread shoe provided with a rail, end hinge elements, a driven roller draft member disposed intermediate said elements, and guiding lugs projecting from said shoe independently of said member and said rail and nearer the longitudinal center of said shoe than said rail.

8. In combination, a sprocket wheel having driving draft elements, and a plurality of pivotally connected tread shoes each having a driven draft element extending from the web of each of said shoes at points remote from the pivotal connection of the shoes to be engaged by said driving draft elements, and being provided with staggered guiding lugs adapted to have engagement with side portions of said sprocket wheel.

9. In combination, a sprocket wheel having driving draft elements and a plurality of tread shoes provided with a rail, end hinge elements, a driven roller draft member disposed intermediate said elements and guiding lugs extending upwardly beyond the plane of the rail and adapted to have lateral engagement with portions of said sprocket wheel.

GEORGE C. JETT.