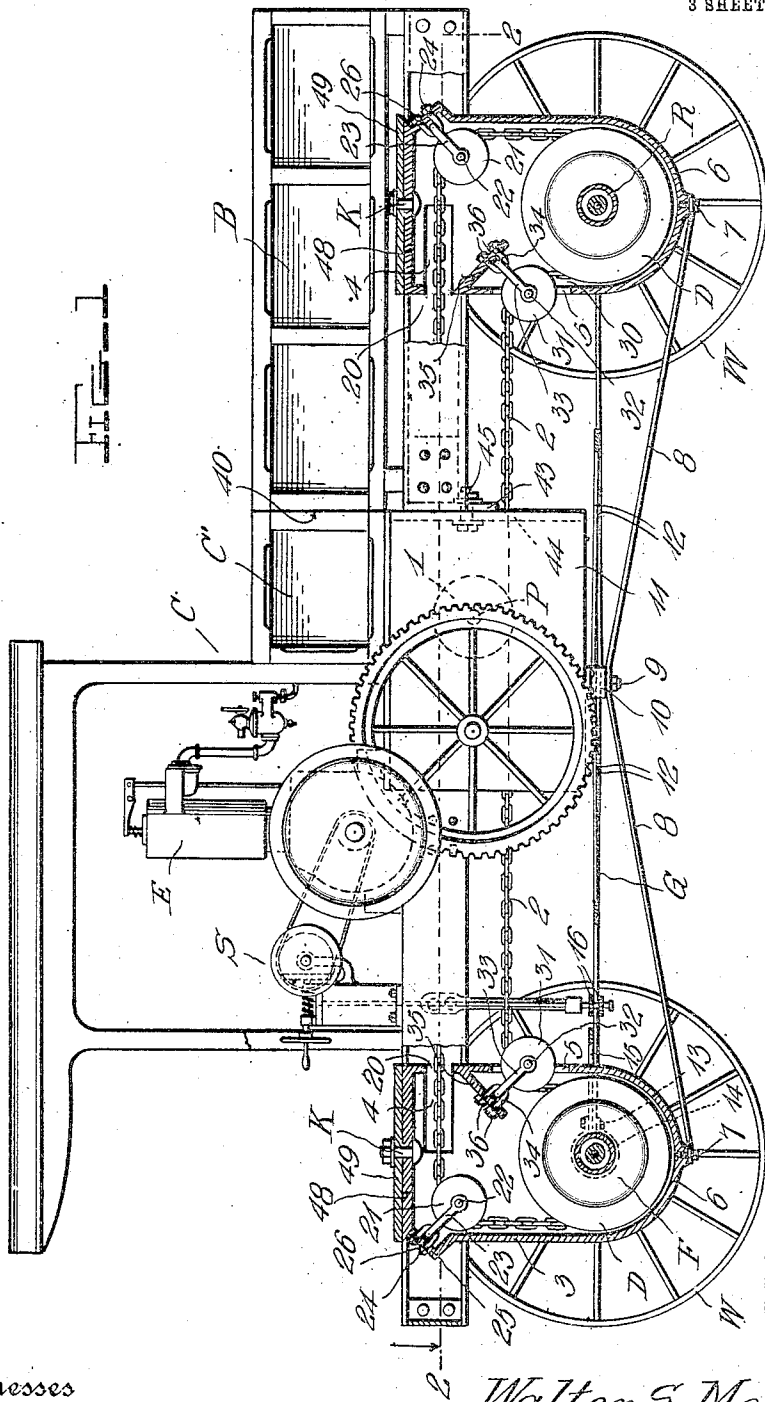


1,042,714.

3 SHEETS—SHEET 1.



E. E. Evans

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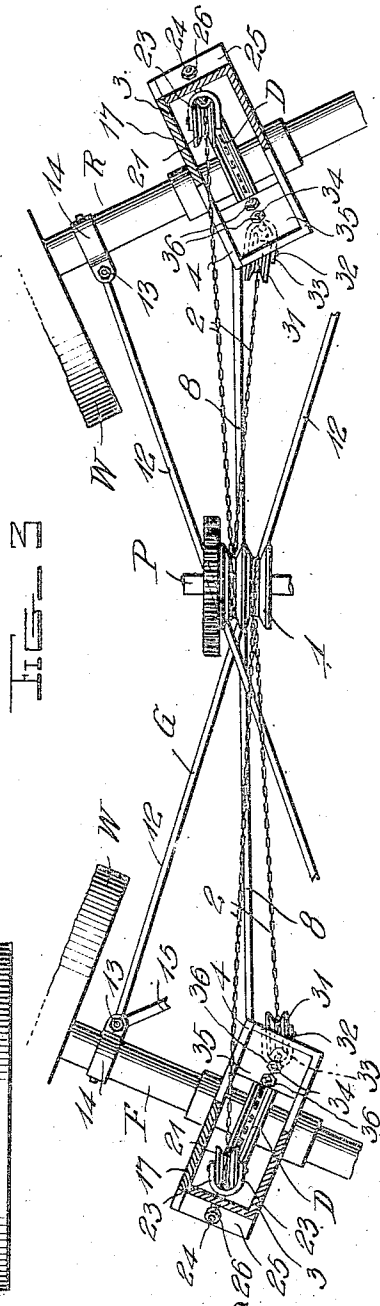
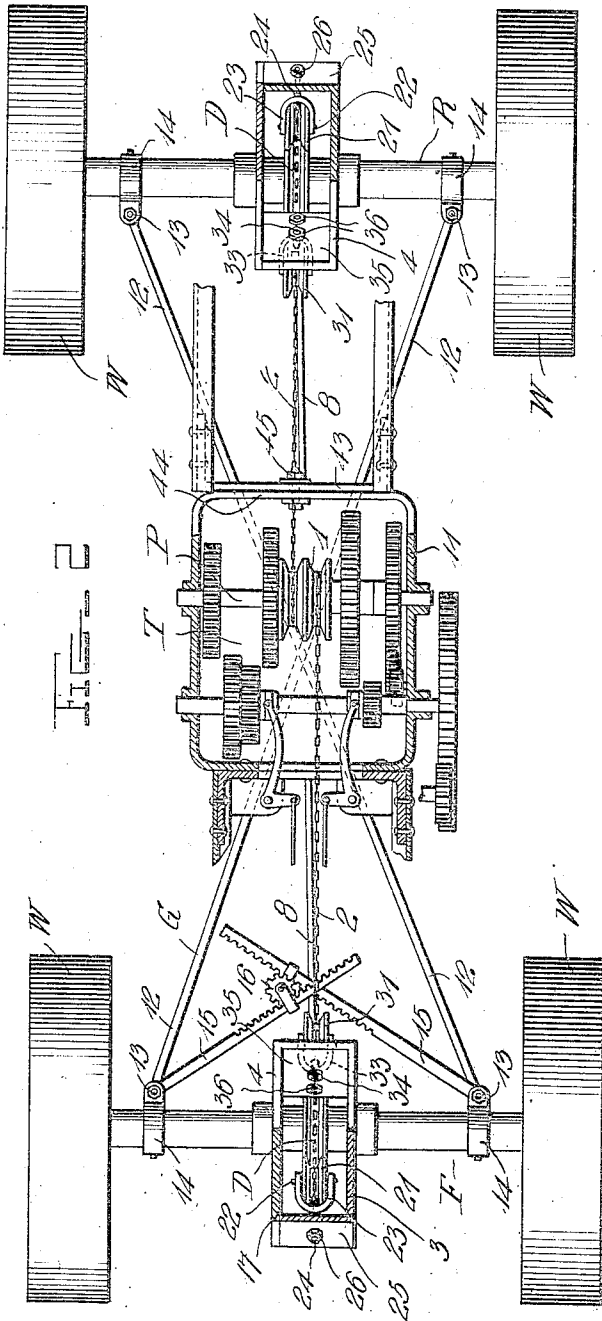
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W. S. MORTON.
DRIVING MECHANISM FOR TRACTION ENGINES.
APPLICATION FILED OCT. 10, 1911.

1,042,714.

Patented Oct. 29, 1912.

3 SHEETS—SHEET 2.



Witnesses

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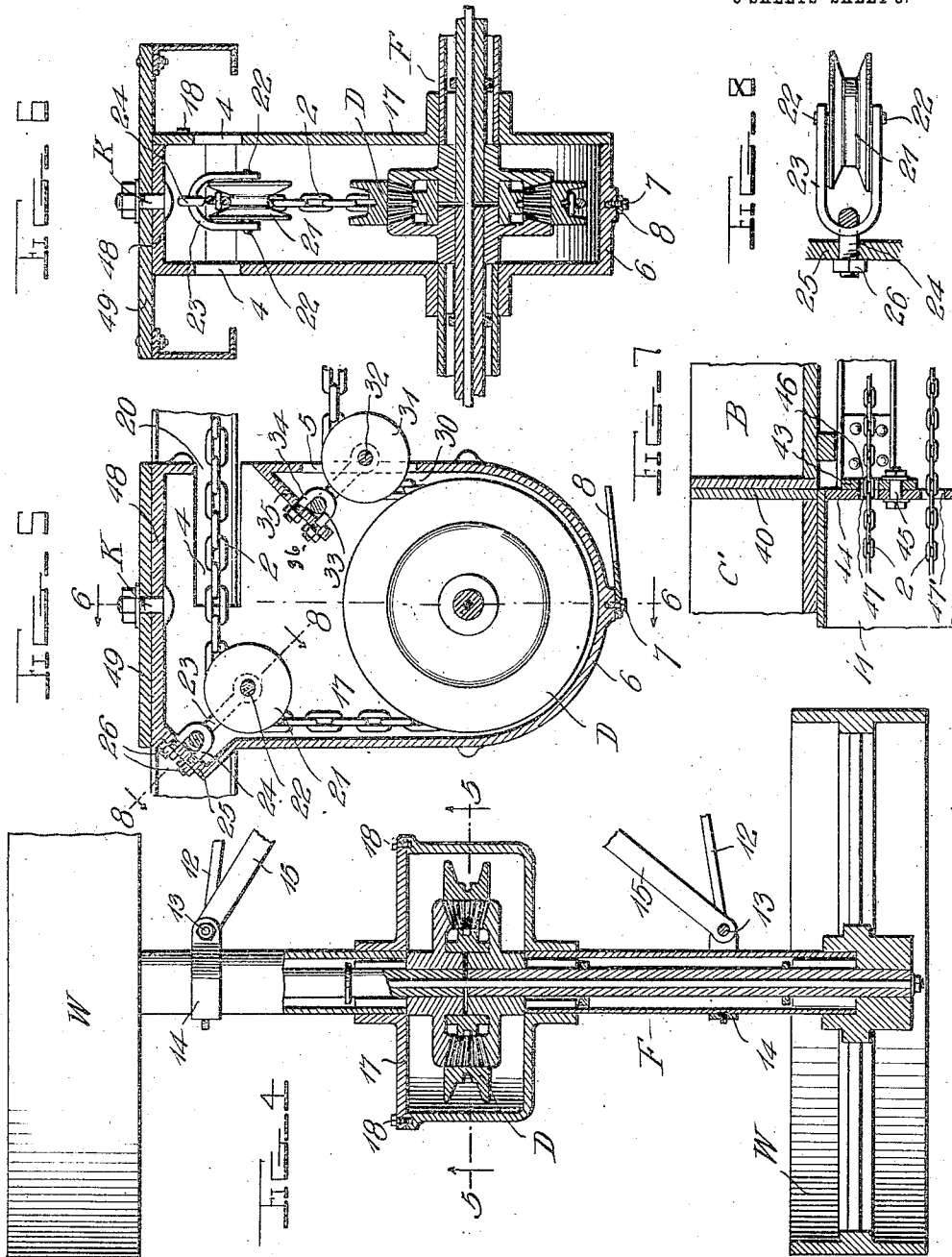
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM FOR TRACTION-ENGINES.

1,042,714.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed October 10, 1911. Serial No. 653,915.

To all whom it may concern:

Be it known that I, WALTER S. MORTON, a citizen of the United States, residing at Portsmouth, in the county of Scioto and State of Ohio, have invented certain new and useful Improvements in Driving Mechanism for Traction-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to traction engines, and more especially to the driving mechanism therefor; and the object of the same is to adapt a chain-driving system to the front and rear axles of a vehicle of this kind which are connected by short-turning mechanism and are also connected by a torsion device.

To this end the invention consists in the specific means for leading the chains from the driving sprockets to the driven sprockets forming parts of the differentials in the two axles; and the invention further consists in the details of the torsion pivot between the two parts of the vehicle frame, permitting the latter to have a sinuous movement over obstructions in the roadway without throwing excessive strain upon the driving chains or the mechanism connected therewith.

The following specification describes in detail the preferred manner of carrying out this invention, reference being had to the drawings wherein—

Figure 1 is a central longitudinal section; Fig. 2 is a horizontal section taken about on the line 2—2 of Fig. 1; Fig. 3 is a horizontal section on the same line with parts of the engine omitted and showing the two axles turned at an angle to each other; Fig. 4 is an enlarged horizontal section through the center of one axle with one end and one wheel in plan view; Fig. 5 is a vertical section on the line 5—5 of Fig. 4; Fig. 6 is a vertical section on the line 6—6 of Fig. 5; Fig. 7 is an enlarged fragmentary sectional detail through the torsion pivot; Fig. 8 is an enlarged detail of one of the guide pulleys and its swinging hanger, this view being taken on the line 8—8 of Fig. 5.

The wheels W of this motor-driven vehicle (which may be a traction engine or an automobile) are secured to the outer ends of front and rear axles F and R respectively, each made in two parts connected by a

differential which includes a driven sprocket D, and the running gear or chassis supported by said axles carries a body comprising a box B and a cab C. In the latter is disposed the steering mechanism S which forms the subject matter of a companion application bearing Serial Number 653,914, and filed herewith, and the gasoline engine E which in the present instance is connected through transmission mechanism T with the power or driving shaft P. The two axles are simultaneously turned in opposite directions around their king bolts K by a short-turning gear G connected with said steering mechanism S as fully explained in my companion application and therefore only referred to herein, but the gist of the present invention lies in the manner of leading the drive chains from the driving to the driven sprockets in a machine of this type embodying the short-turning gear, the steering device, and the torsion pivot which will be described below.

Mounted on the power shaft P is a double sprocket wheel 1 from whose halves or sides chains 2 lead forward and backward to the front and rear axles respectively, and as the construction at the outer end of each chain duplicates that of the other I will describe but one. The king bolt K passes through some part of the framework or chassis as seen in Fig. 6 and supports beneath the same a housing 3 having slots 4 in its sides and its upper end, an opening 5 in its inner wall, and a rounded or drum-like lower end 6 which surrounds and incloses the driven sprocket D upon the axle. Pivottally mounted to the lowest point of this drum at 7 is a brace rod 8 which leads upward and inward and is connected as at 9 to the center of a loop-shaped guide 10 which is by preference carried beneath the casing 11 that incloses the transmission mechanism, and through which guide pass the rods or bars 12 of the short turning gear G above referred to. The outer ends of these rods or bars are pivottally connected as at 13 with collars 14 surrounding the axles near the wheels W, and the centers of said rods cross each other loosely where they pass through said guide 10 as usual in short-turning gear. The steering mechanism, best seen in Fig. 2, comprises a pair of racks 15 mounted on the same pivots 13 on the front axle F to which said rods 12 are pivoted, and gears 16 en-

gaging said racks and connected with the steering wheel within the cab C. It is sufficient in this patent to remark that manipulation of the steering wheel turns the front axle in either direction, and this axle through the rods or bars 12 turns the rear axle in the opposite direction simultaneously, the chains 2 meanwhile driving both axles and their differentials permitting the wheels on the outside of the curve to turn more rapidly than those on the inside.

In Fig. 4 is best shown how one wall 17 of the housing 3 may be made removable by means of screws 18 so that access to its interior can be had, but I do not limit myself to this specific construction; nor have I in this patent illustrated in detail the exact form of drive chain which I prefer to employ, as the same forms the subject matter of a companion application filed this day by me and bearing Serial Number 653,916 and it will be understood that the face of the driving and driven sprockets will be shaped to conform with said chain.

Referring now to Figs. 5 and 6, the upper side of the chain 2 enters the slot 4 at the point 20 therein, passes across the top of the housing 3 and over a pulley 21 having stub shafts 22 mounted in a yoke 23 forming part of a swinging hanger, the other part thereof being a U-bolt 24 whose bend embraces the bend of the yoke 23 and whose threaded extremities are passed through a bracket 25 in the upper inner corner of the housing and receive nuts 26; and after passing over said pulley 21 the chain passes down around the driven sprocket D and up at the opposite side at the point 30. Here in similar manner it passes over a pulley 31 journaled at 32 in a yoke 33, and the bend of this yoke engages a U-bolt 34 whose extremities pass through a bracket 35 and receive nuts 36; and after the chain is led over this pulley 31 it passes out the opening 5 in the inner wall of the housing 3 and extends to the driving pulley 1. The guide pulleys 21 and 31 are duplicates of each other, and one of them is well illustrated in Fig. 8 while both of them are shown in Fig. 5 in their relative position to each other and to the driven sprocket D. The obvious purpose of this construction is to permit said pulleys to swing aside on the hangers which support them, and the position they assume when the vehicle is making a turn is best seen in Fig. 3. The nuts 36 of the innermost pulley 31 may be reached by removing the wall 17 of the housing 3, but the nuts 26 of the other pulley 21 may be reached from the exterior and by tightening them up a little the chain can be tightened to remove considerable slack. When the latter becomes excessive, links must be removed from the chain as usual. It is obvious that if effort were made to drive two shafts or axles con-

nected by a short-turning gear, by means of chains led to an intermediate source of power, the chains would soon disengage the driven sprockets unless some such means be employed as the guide pulleys and their swinging hangers just described. It may be true that a chain wherein the links are rather loosely connected will to a degree flex laterally, but in a short-turning vehicle this lateral movement is liable to unship the chains from their driven sprockets, even though the latter be provided with teeth and the teeth be made quite long. Hence the advantage of this portion of my invention will be obvious.

By preference the rear wall 40 of the cab end C of the body is an upright one (or a tool box C' may form part of the cab as best seen in Fig. 1), and while the box B may be given any desired form, its front wall terminates close to but just out of contact with said rear wall 40. The framework or chassis of this improved vehicle may be made as desired, but if it is long it should have some flexibility so as to permit the wheels to pass over obstructions. Accordingly I make the framework in two portions which have transverse face plates 43 and 44 respectively, standing in frictional contact with each other and connected by a central pivotal bolt 45; and as seen in Fig. 1 this bolt stands at a point below the rear wall 40 of the cab C and therefore as the vehicle passes over obstructions and its body has a sinuous or torsional movement the front end of the box B may move relatively to the rear wall of the cab C and the face plates 43 and 44 may rub against each other as they swing relatively around the torsion bolt 45. It will be obvious that in vehicles of this kind—especially when constructed of considerable length and weight as for heavy loads—if the body comprised a box and cab made in one piece it would be likely to itself partake of the sinuous movements of the running gear when passing over obstructions which would in time rack it at its angles and elsewhere. Ordinarily for long-bodied vehicles this contingency is provided for by the use of bolsters and king bolts which permit a certain lateral play of the body, but in this case each housing 3 preferably has a flat top 48 forming a plate which fits closely beneath and rubs against another plate 49 in the framework or chassis around the king bolt K as seen at the left of Fig. 1, and the connection thus afforded between these parts increases the need for some such feature of improvement as above described. Moreover, the absence of springs in this vehicle also increases the necessity for a certain flexibility or pliability in the long body under the conditions above set forth, and this need is met by this feature of improvement. However, it is quite possible that if the

springs were provided, if the body were shorter, or if modifications in the structure above described were made which are possible within the spirit of my invention, the torsion bolt and the parts connected therewith might be omitted. I do not limit myself to the strict details of construction hereinbefore set forth, nor to the sizes, shapes, proportions, and materials of parts. Finally, when this torsion bolt is used in a motor vehicle driven by a chain which extends across the pivotal line, here indicated by the plane in which the face plates 43 and 44 make contact as best seen in Fig. 7, said plates have registering slots 46 and 47 respectively above, and a slot 47' below the torsion bolt 45 through which pass the two stretches of the driving chain 2, and it is obvious that as the parts of the framework move upon each other around said torsion bolt, each pair of registering slots will leave an opening through which the chain may pass without interruption.

What is claimed as new is:

1. In a motor vehicle, the combination with the framework mounted on wheels, a housing inclosing one axle and pivoted beneath the framework, and a driving sprocket carried by said framework between the axles; of a driven sprocket within said housing, a drive chain connecting said sprockets, a guide pulley for each stretch of said chain, and swinging hangers for said pulleys adjustably mounted within said housing.

2. In a motor vehicle, the combination with the framework having a king bolt, a housing pivotally mounted thereon and having slots, brackets within said housing respectively opposite said slots, an axle carried by the housing, and a driven sprocket thereon located below said brackets and within the housing; of a driving sprocket carried by said framework, a drive chain connecting said sprockets, a guide pulley for each stretch of said chain, and swinging hangers for said pulleys respectively connected with said brackets.

3. In a motor vehicle, the combination with the framework including a transverse plate, a king bolt therethrough, a housing having a top plate resting under said transverse plate and pivotally mounted on said bolt, a two-part axle carried by said housing, and a differential connecting the parts

thereof and including a driven sprocket; of a driving sprocket beneath said framework, a chain connecting said sprockets, a guide pulley for each stretch of said chain, and swinging hangers for said pulleys mounted within said housing.

4. In a motor vehicle, the combination with the framework, two axles pivotally mounted beneath it, a short-turning gear connecting said axles, a driven sprocket on each axle, and a driving sprocket mounted on the framework between them; of drive chains leading from said driving sprocket to the two driven sprockets, housings inclosing the latter, two guide pulleys within each housing one for each stretch of chain, and swinging hangers for said pulleys adjustably mounted within said housings.

5. In a motor vehicle, the combination with the framework, housings pivoted beneath its ends, the axles carried by said housings, a driven sprocket on each axle inclosed by the housing, and a driving sprocket mounted on the framework between said axles; of a casing inclosing said driving sprocket, a transverse guide loop beneath said casing, a short-turning gear connecting said axles and consisting of crossed rods passing through said loop, brace rods connecting this loop with the lowest points of said housings, drive chains leading from said driving sprocket to the two driven sprockets, and guide pulleys within each housing one for each stretch of said chain.

6. In a motor vehicle, the combination with the framework made in two parts having abutting face plates at their contiguous ends, said plates provided with two pairs of registering slots, a torsion bolt pivotally connecting said plates between said pairs of slots, and a body mounted on the framework; of the driving mechanism and axles, a driven sprocket on one of the latter and a driving sprocket in said mechanism, and a drive chain connecting said sprockets and its stretches passing respectively through said slots.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WALTER S. MORTON.

Witnesses:

LEON F. MILLER,
HARRY W. KEENY.