Oct. 21, 1924. 1,512,562

L. RADIES

TRACTOR

Filed Dec. 27, 1920 4 Sheets-Sheet 1

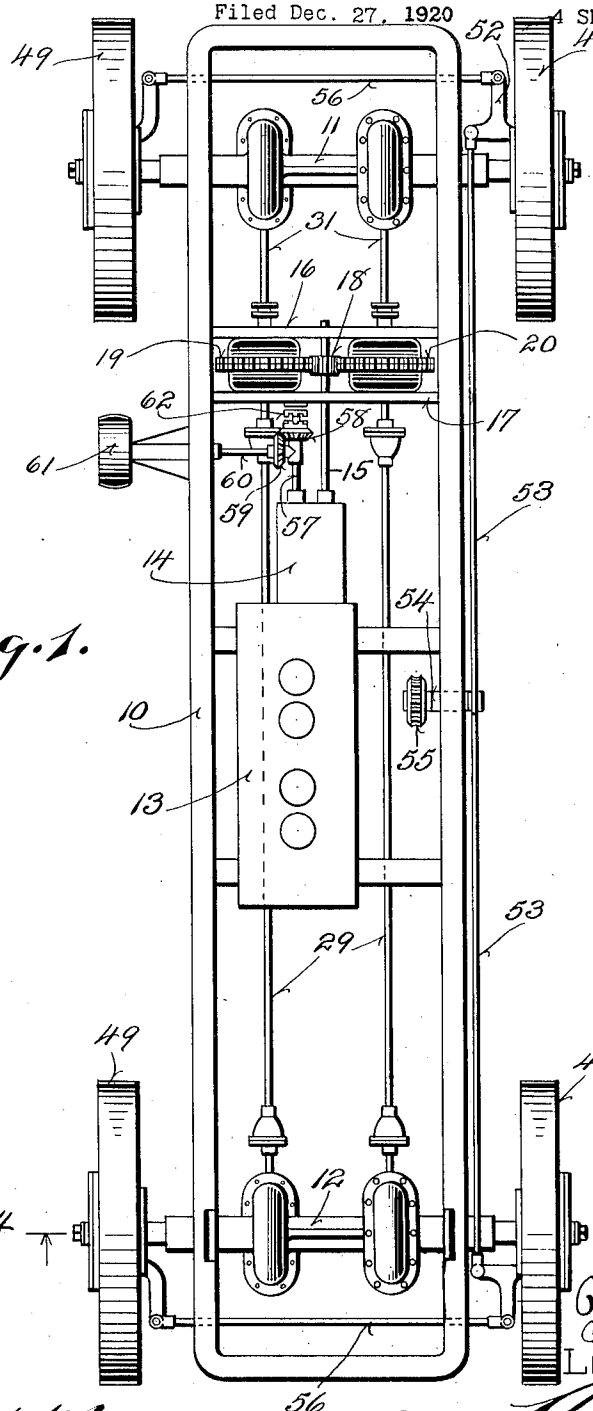


Fig. 1.

Witness:
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Oct. 21, 1924. 1,512,562

L. RADIES

TRACTOR

Filed Dec. 27, 1920 4 Sheets-Sheet 2

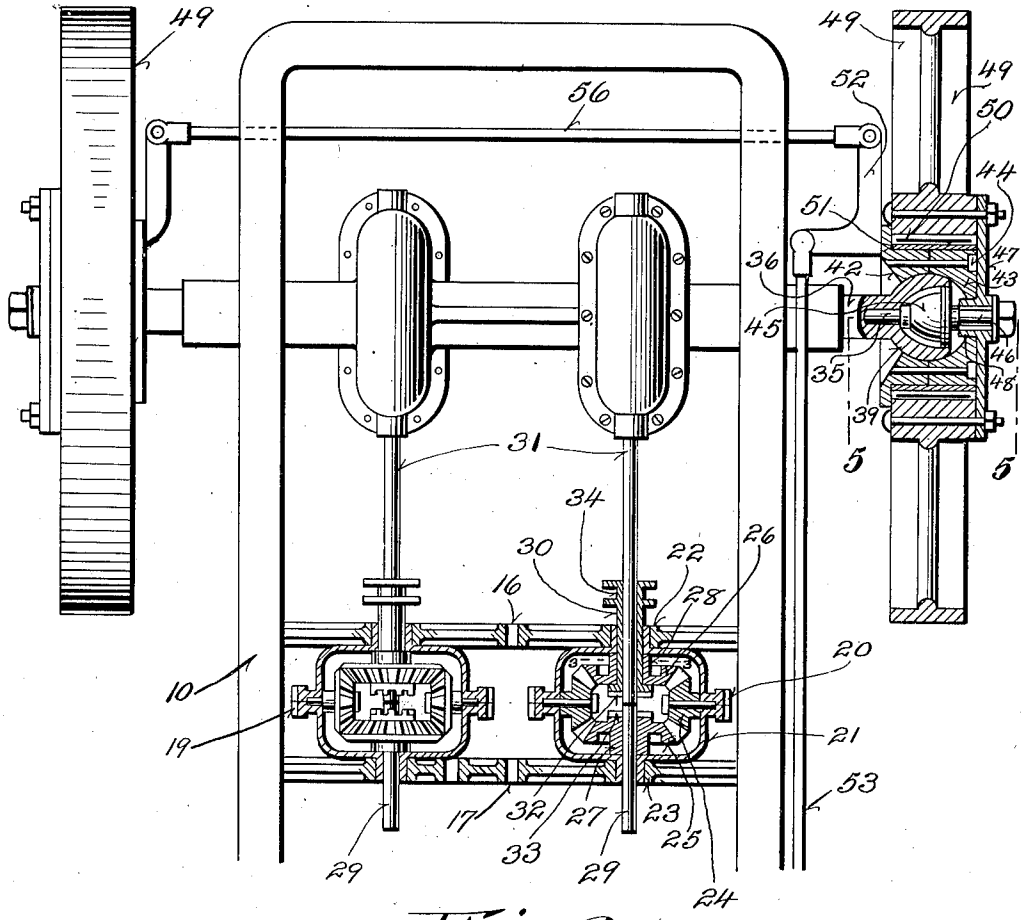


Fig. 2.

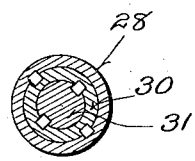


Fig. 3.

Witness.

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TRACTOR

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Fig. 4.

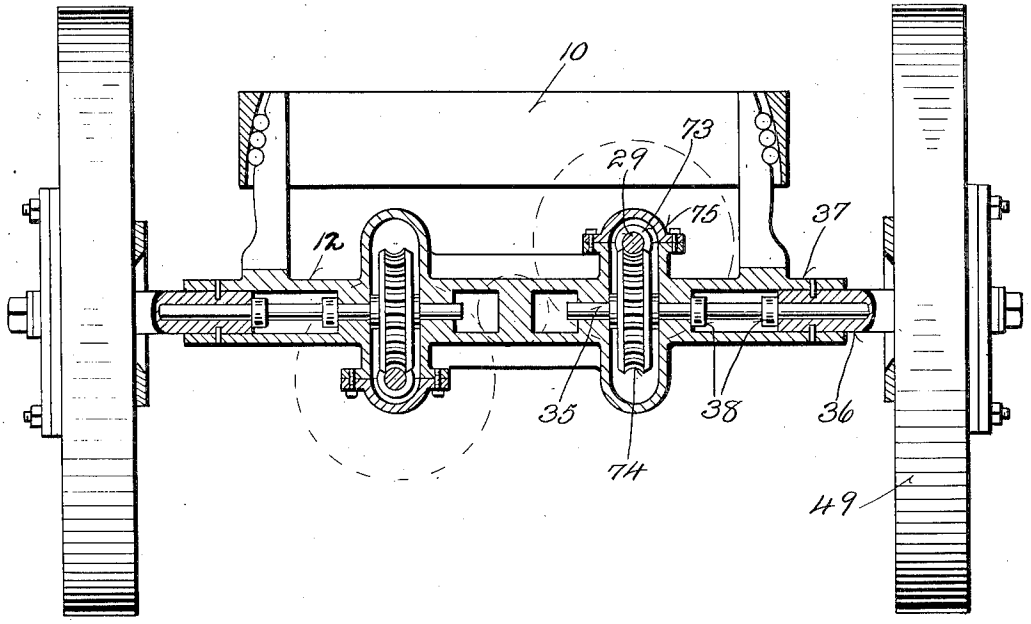
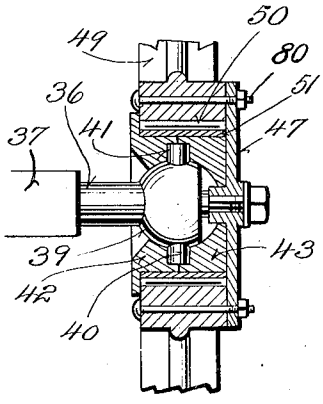


Fig. 5.



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TRACTOR

Filed Dec. 27, 1920 4 Sheets-Sheet 4

Fig. 1.

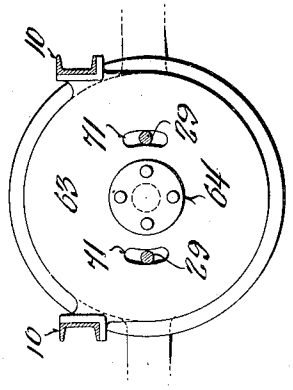
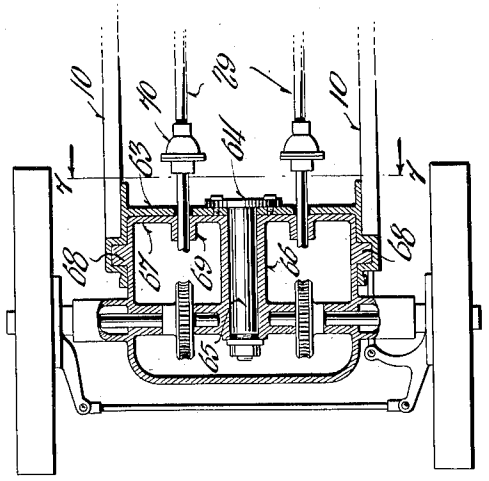


Fig. 2.



Witness:

Inventor:

Leonard Radies

By Young, Young,

Attorneys.

Patented Oct. 21, 1924. 1,512,562

UNITED STATES PATENT OFFICE.

LEONARD RADIES, OF BIG FALLS, WISCONSIN.

TRACTOR.

Application filed December 27, 1920. Serial No. 433,335.

To all whom it may concern:

Be it known that I, LEONARD RADIES, a citizen of the United States, and resident of Big Falls, in the county of Waupaca and State of Wisconsin, have invented certain new and useful Improvements in Tractors; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to tractors and more especially to the type in which all four wheels are motor driven.

One of the objects of the invention is to provide differentials between the front and rear drive wheels, and also to provide means for locking said differentials when desired.

Another object is to provide a device of this kind in which the motor may be used for furnishing power to drive other machinery.

It is also within the scope of the invention to improve generally the arrangement and structure of the mechanism for transmitting the power from the motor to the traction wheels.

In describing my invention reference will be had to the accompanying drawings, in which:

Figure 1 is a plan view of my improved tractor.

Figure 2 is a sectional plan view of one end of the tractor.

Figure 3 is a detail sectional view on the line 3—3 of Figure 2.

Figure 4 is a vertical sectional view on the line 4—4 of Figure 1.

Figure 5 is a vertical sectional view on the line 5—5 of Figure 2.

Figure 6 is a sectional plan view of a modified form of connection between the frame and the front axle, and

Figure 7 is a sectional detail on the line 7—7 of Figure 6.

The tractor comprises a frame 10, which is mounted in any preferred manner on the axle housings 11 and 12. Supported on the frame 10 is the motor 13 and transmission mechanism 14 which drives the shaft 15 which is journalled in the transverse members 16 and 17 of the frame. Mounted on the shaft 15 between the transverse members 16 and 17 is the driving pinion 18 which is operatively connected to the ring gears 19 and 20 of the differentials. Since the differentials are substantially the same in all respects only one will be described.

The ring gear 20 is carried on the frame 21 which is provided with the trunnions 22 and 23 journalled in the transverse members 16 and 17. Spider gears 24 are revolubly attached to the inside of the ring gear and mesh with the driving gears 25 and 26 which are provided with the spacing hubs 27 and 28. The gear 25 is mounted on the shaft 29 which extends to the axle at one end of the tractor. The driving gear 26 and its hub 28 are keyed on the slidable sleeve 30 which is in turn keyed on the shaft 31 which extends to the axle at the other end of the tractor.

The sleeve 30 is provided at one end with clutch teeth 32 which are adapted to engage the clutch teeth 33 on the inner side of gear 35, and is provided at its other end with the grooved member 34 by means of which it may be moved longitudinally to engage or disengage said clutch teeth.

The purpose of this structure is to enable the driver to lock the drive shafts 29 and 31 together in case one of the traction wheels is slipping while the other is on hard ground. Each of the shafts 29 and 31 is provided with means for connecting the same to one of the traction wheels. This means comprises a worm 73 which engages a worm gear 74 which is enclosed in the enlarged portion 75 of the axle housing. The worm gear is mounted on the axle 35 which is journalled at one end in the housing, and at the other end in the sleeve 36 which is secured within the end 37 of the axle housing. The axle is held against longitudinal movement by the collars 38.

The sleeve 36 projects beyond the axle housing and terminates in the spherical bearing member 39, having the vertically extended pins 40 and 41 on which is rotatably mounted the box consisting of the two parts 42 and 43 held together by rivets or the like 44.

The axle 35 extends beyond the head 39 and is connected by the universal joint 45 with the stub axle 46 to which is keyed the plate 47 which is provided with the boss 48 which is rotatably received in the member 43.

The traction wheel 49 is journalled by roller bearings 50 on the sleeve 51 which surrounds the members 42 and 43, and said wheel is securely held to the plate 47 by the bolts 80. To the member 42 is rigidly attached the bell crank 52, which is connected by a rod 53 to the steering shaft 54 which is operated by means of the worm gear 55,

The bell cranks 52 at each end of the machine are connected to operate simultaneously by means of the rod 56.

The primary shaft of the transmission mechanism is extended beyond its casing as shown at 57 and carries a gear 58 which engages a gear 59 on the shaft 60 which projects laterally from the frame and is provided at its end with the pulley 61 for driving other machinery as desired. The gear 58 is operatively connected or disconnected from the shaft 57 by means of a clutch 62.

In the construction shown in Figures 6 and 7, the sides of the frame 10 are joined at their front ends by a bearing plate 63 to the center of which is firmly secured the head 64 of a forwardly extending pivot bolt 65. The front axle housing is formed with a rear extension 66, which is pivoted on the bolt 65 and with the plate 67, which is seated on the bearing plate 63. The housing is also provided with tongues 68, which are guided in grooves formed in the side members of the frame 10. Thus provision is made for play between the axles and the frame, while the tractor is moving over uneven ground. The plates 67 have bearings 69 which carry the forward ends of the shafts 29, the shafts being provided with universal joints 70 to allow for the pivotal movement. The plate 63 is also provided with slots 71, in which the shafts 29 may ride up and down.

I claim as my invention:

A tractor comprising a frame, an axle housing at each end of the frame, a two part axle in each housing, a traction wheel having driving connection with each axle, the axle housing at one end of the frame being pivoted to said frame to swing on a longitudinal axis, and a drive shaft at each side of said pivot having driving connection with the axle on that side.

In testimony that I claim the foregoing I have hereunto set my hand at Big Falls, in the county of Waupaca and State of Wisconsin.

LEONARD RADIES.