July 16, 1968 J. F. BRYAN, JR 3,392,681

CONVERTIBLE RAIL-TRACTOR VEHICLE

Filed Dec. 14, 1964 3 Sheets-Sheet 1

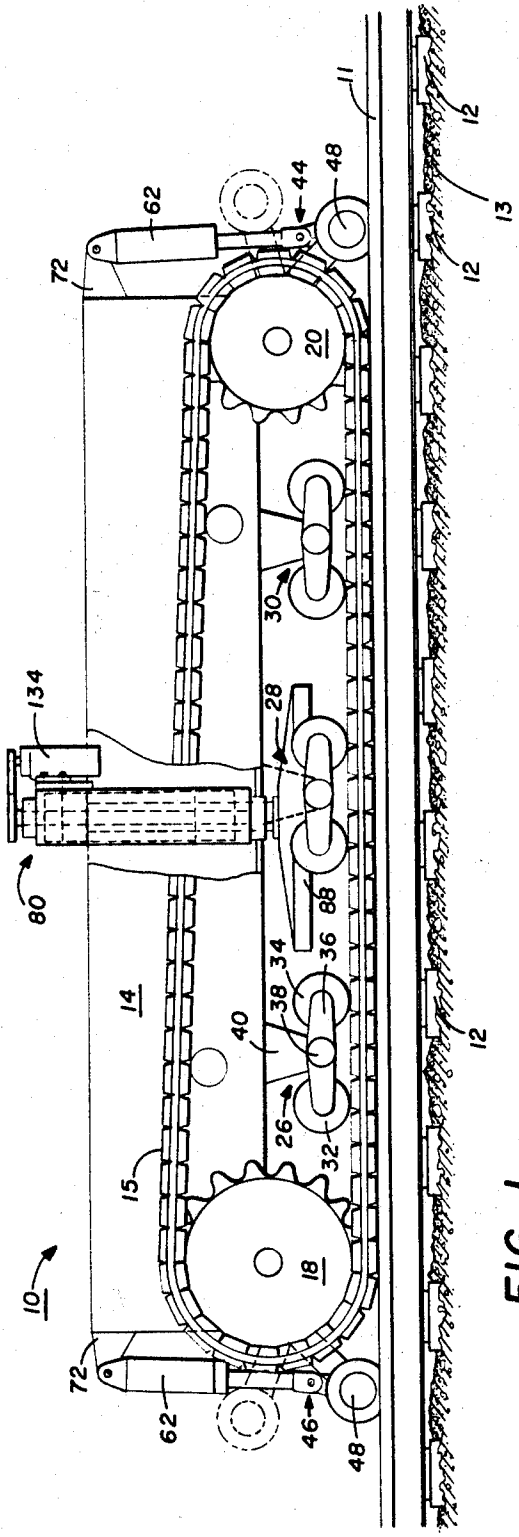


FIG. 1

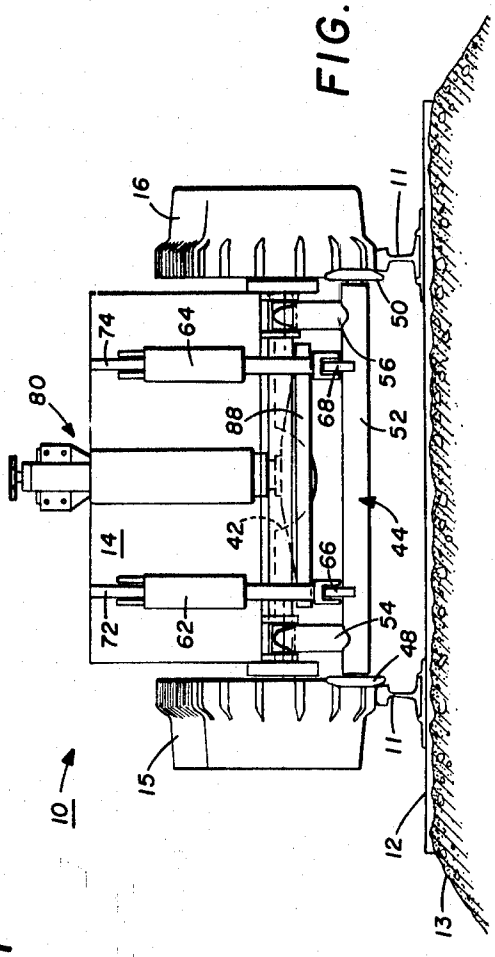


FIG. 2

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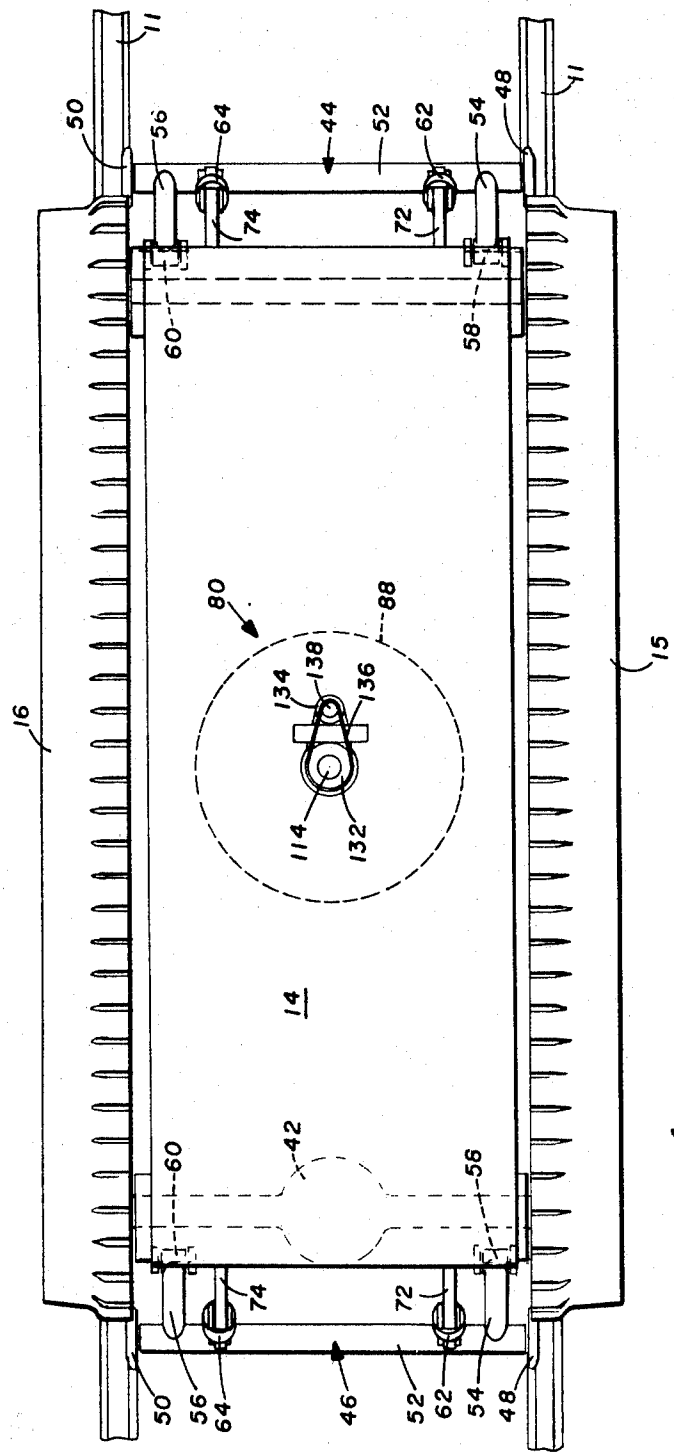


FIG. 3

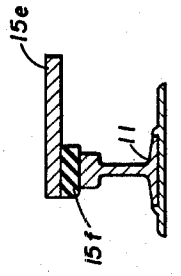


FIG. 11

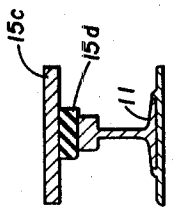


FIG. 10

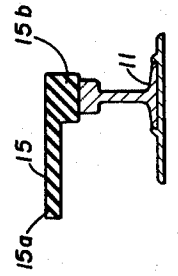


FIG. 9

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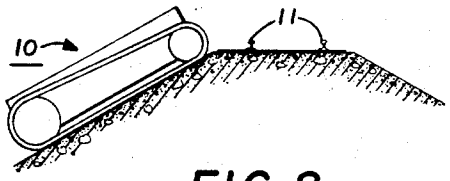


FIG. 8

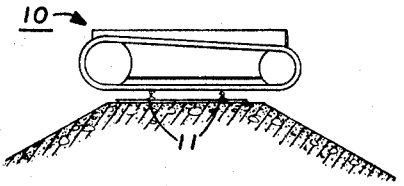


FIG. 7

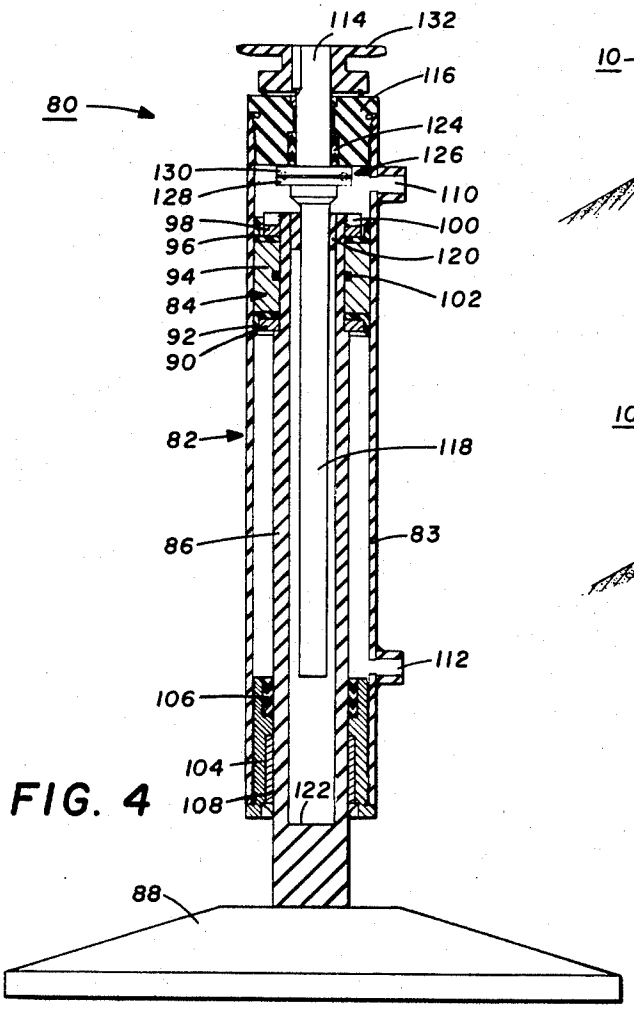


FIG. 4

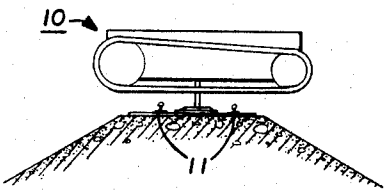


FIG. 6

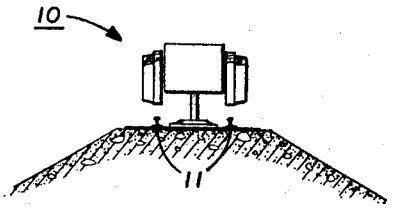


FIG. 5

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United States Patent Office

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CONVERTIBLE RAIL-TRACTOR VEHICLE

John F. Bryan, Jr., Dallas, Tex., assignor to Trakwork Equipment Company, Irving, Tex., a corporation of Texas

Filed Dec. 14, 1964, Ser. No. 418,009
15 Claims. (Cl. 105—215)

ABSTRACT OF THE DISCLOSURE

A maintenance vehicle for use on railroad tracks including a pair of motor driven endless crawler treads operatively connected to and disposed on opposite sides of the vehicle chassis. A turntable is connected to the chassis at the center of gravity thereof, and includes a rod for lowering a foot portion of the turntable to the ground and for raising the vehicle until the crawler treads clear the railroad tracks. Motor driven mechanism is provided to rotate the vehicle chassis about the rod. The vehicle may then traverse the railroad tracks for normal maintenance work, and when desired be raised, rotated, lowered and driven from the tracks. The vehicle may then be driven back onto the tracks, raised, rotated and lowered back onto the railroad tracks to continue maintenance work.

The present invention relates to machines for performing various maintenance functions on the track, bed or right-of-way of a railroad, and more particularly relates to a work-over machine which traverses the tracks while carrying out the maintenance operation, but which may be driven off the track to permit a train to pass.

It is common for a maintenance machine to travel along a railroad track while performing various types of maintenance or work-over operations on the railroad right-of-way, ballast, rails, etc. At the present time, the use of such machines must be carefully planned around the schedules of regular trains so that the machine can be removed from the track to permit the trains to pass. The vehicles and machines presently used for this type of operation can in general be removed from the main track only at specially prepared landings, or at existing track sidings. Since trains cannot closely follow schedules, and often have no schedule, and since the special landings and sidings are often quite far apart, considerable working time is lost while proceeding to, waiting at, and returning from the place at which the maintenance machine can be removed from the track.

The present invention is concerned with a self-propelled maintenance vehicle or machines for railroads which will normally travel along the rails of the track while carrying out the maintenance operation, yet which may be driven from the track onto substantially any terrain to let a train pass, then driven back onto the track to continue the maintenance operation.

The maintenance vehicle in accordance with this invention comprises a chassis, a pair of endless crawler-type treads, preferably adapted to run on the rails of the track, and a turntable mechanism for lifting the vehicle to clear the rails, rotating the vehicle approximately 90°, and lowering the vehicle back onto the rails with the treads disposed across the rails. The vehicle can then be driven off to the side of the track to permit a train to pass, then driven back onto the track, raised, rotated back into alignment with the rails, and lowered for continued operation.

In accordance with another aspect of the invention, guide means are provided fore and aft of the vehicle for engaging the rails and maintaining the endless tread properly positioned on the rails. Means are also provide for raising the guide means to clear the rails while the vehicle is being driven transversely of the rails.

In accordance with a more specific aspect of the invention, a turntable mechanism is provided which comprises a hydraulic cylinder connected to the vehicle substantially at the center of gravity of the vehicle and oriented vertically, a piston reciprocally disposed within the cylinder, a piston rod connected to the piston and extending through the lower end of the cylinder, a foot plate for engaging the roadbed connected to the lower end of the piston rod, fluid port means in the cylinder for reciprocating the piston within the cylinder, a second rod slidably disposed within the piston and piston rod and keyed against rotation relative to the rod, and extending through and journaled in the upper end of the cylinder for rotation relative to the cylinder, and means interconnecting the end of the second rod extending through the cylinder and the cylinder for rotating the cylinder relative to the piston rod.

Therefore, an object of the present invention is to provide a maintenance vehicle for a railroad track which can be rapidly and easily moved from the track at substantially any point, under its own power, to permit a train to pass, and then driven back onto the track, under its own power, for continued maintenance operation.

Another object of the invention is to provide a powered turntable mechanism for lifting and rotating a vehicle or other load.

Yet another object is to provide a turntable mechanism of the type described which is simple in construction and occupies a minimum amount of space.

Another object of the invention is to provide such a vehicle which will not damage the track rails as its is driven over the rails.

A further object of the invention is to provide a vehicle of the type described which will traverse soft, rocky, steep and rough terrain.

Still another object of the invention is to provide a vehicle of the type described which will travel on the rails of the track.

Additional objects and advantages of the invention will be evident to those skilled in the art from the following detailed description and drawings, wherein:

FIGURE 1 is a side elevation of a vehicle constructed in accordance with the present invention;

FIGURE 2 is a front elevation of the vehicle of FIGURE 1;

FIGURE 3 is a top view of vehicle of FIGURE 1;

FIGURE 4 is a sectional view of a turntable mechanism constructed in accordance with this invention and used in the vehicle of FIGURE 1;

FIGURES 5, 6, 7 and 8 are schematic drawings illustrating the operation of the vehicle of FIGURE 1; and

FIGURES 9, 10 and 11 are sectional views of alternative endless treads which may be used in the present invention.

Referring now to the drawings, and in particular to FIGURE 1, a vehicle constructed in accordance with the present invention is indicated generally by the reference numeral **10**. The vehicle **10** may be any desired maintenance vehicle or machine for performing work-over or maintenance operation on the rails **11**, ties **12**, ballast **13** or the right-of-way, or may be merely a transportation vehicle or the like. The vehicle **10** has a chassis **14** represented only in outline for purposes of this disclosure.

A rear pair and front pair of sprocket wheels **18** and **20** are provided at the rear and front of the chassis **14**. Right-hand and left-hand endless crawler treads **15** and **16** pass around and are retained on the rear and front sprocket wheels **18** and **20** on each side of the chassis. The endless crawler treads **15** and **16** are preferably fabricated from rubber so as to minimize marring of the track rails,

and may be reinforced by suitable tension members such as cords or wires or other suitable resilient material. The endless crawler treads **15** and **16** are spaced or gauged so as to ride on the rails **11**, and the sprocket wheels are preferably disposed directly over the rails. The treads **15** and **16** are wide enough to support the weight of the vehicle in relatively soft material along the side of the track. Conventional idler wheel assemblies **26**, **28** and **30** may be connected to the chassis and ride on the lower reaches of the treads **15** and **16**. Each of the assemblies **26**, **28** and **30** may be comprised of a pair of rollers **32** and **34** journaled at the ends of a horizontal member **36** which in turn is pivotally connected by a pin **38** to a vertical support **40** connected to the chassis.

The endless crawler treads **15** and **16** may be driven by the rear sprocket wheels **18** which in turn may be driven by a prime mover (not shown) mounted on the chassis **14** and coupled to drive a conventional automotive type differential indicated generally by the reference numeral **42** and shown in dotted outline in FIGURES 2 and 3. As will hereafter be more evident, differential steering of the vehicle by means of a differential drive system connected to the endless track as in the conventional crawler tractor is not required, although such a steering system may be employed if desired. This materially simplifies the vehicle.

In accordance with an important aspect of the invention, the crawler treads **15** and **16**, or the support means such as wheels as hereafter described, have a transverse cross section substantially as illustrated in FIGURE 9 so as to adapt the treads to travel on the rails during normal operation, yet traverse soft earth beside the tracks even when carrying a heavy load. Thus, it will be noted that the transverse cross section of the tread **15** is characterized by a wide flange portion **15***a* and a lug portion **15***b* which is considerably narrower and projects downwardly from the web portion **15***a* to engage the rail **11**. The tread **15** may be a conventional metal crawler tread formed from linked metal plates to which resilient lug portions have been bonded, or the tread may be formed entirely of rubber reinforced with suitable tension cords imbedded in the rubber as illustrated in FIGURE 9. In the embodiment of FIGURE 9, the web portion **15***a* extends outwardly from the lug portion **15***b* with respect to the vehicle. The lug portion **15***b* is made narrow, preferably less than 5 inches in width, so as to pass self-guarded frogs and other obstructions associated with a standard railroad, and is preferably at least 2.5 inches in height so that the flange portion **15***b* will clear all obstructions associated with the standard railroad tracks.

An alternative embodiment of the crawler treads **15** and **16** or other support means is shown in cross section in FIGURE 10 wherein the web portion **15***c* is comprised of a relatively wide metal plate, and the lug portion **15***d* is comprised of a considerably more narrow rubber portion disposed at the center of the plate **15***c*. The dimensions of the lug portion **15***d* are the same as those of the lug portion **15***b* of FIGURE 9 for the same reasons. Yet another embodiment of the crawler treads **15** and **16** is illustrated in FIGURE 11 wherein the web portion **15***e* extends inwardly from the lug portion **15***f* rather than being centered over the lug portion as in the embodiment of FIGURE 10, or extending outwardly as in the embodiment of FIGURE 9. The embodiments of FIGURES 10 and 11 may also be fabricated entirely from rubber with appropriate flexible tension members (not illustrated) imbedded therein, or may be conventional crawler treads formed from linked metal plates to which resilient lugs have been bonded, or on which metal lugs are used.

The crawler treads **15** and **16** are maintained on the rails **11** by guide means indicated generally by the reference numerals **44** and **46** disposed at the opposite ends of the vehicle chassis **14**. The guide means **44** and **46** are of substantially identical construction and corresponding components are therefore designated by corresponding reference numerals. The guide means **44**, for example, is comprised of a pair of wheels **48** and **50** which are mounted on a shaft journaled in a housing **52**. The shaft for the wheels **48** and **50** may be a continuous shaft, or may be separate shafts journaled in the housing **52**. The wheels **48** and **50** are spaced or gauged so as to ride between the inner edges of the rails **11** and are preferably tapered to center the vehicle as the guide wheels are lowered as will hereafter be described. The housing **52** is rigidly connected to a pair of arms **54** and **56** which are pivotally connected to the chasis **14** by trunnions **58** and **60**, respectively. The housing **52**, and therefore the guide wheels **48** and **50**, are raised and lowered by means of hydraulic linear actuators **62** and **64** the piston rods of which are pivotally connected to the housing **52** at **66** and **68**, respectively, and the cylinders of which are pivotally connected to brackets **72** and **74** which are secured to the chassis **14**. Thus the guide wheels **48** and **50** may be raised and lowered through vertical arcs, but are rigidly positioned with regard to the vehicle in the transverse direction.

A turntable mechanism indicated generally by the reference numeral **80** and shown in detail in FIGURE 4 is provided to lift and rotate the vehicle **10**. The turntable mechanism **80** is comprised of a hydraulic or other fluid cylinder **82** which is disposed vertically at the center of gravity of the vehicle **10** and rigidly connected to the chassis **14** by suitable means (not illustrated). A piston **84** is reciprocally disposed within the cylinder **82** and is connected to a piston rod **86** which extends through the lower end of the cylinder and is rigidly connected to a large foot plate **88**. The foot plate **88** may conveniently be circular in shape, as illustrated in dotted outline in FIGURE 3, and preferably has a diameter sufficiently large to span at least two and preferably three of the railroad ties **12**, yet sufficiently small to be lowered between the rails **11**.

The piston **84** may be of any suitable construction, and may comprise a rigid washer **90** abutting a shoulder on the rod **86**, a sealing cup **92**, a doughnut-shaped body **94**, an upper sealing cup **96**, an upper washer **98**, and a nut **100** which is threaded onto the upper end of the piston rod **86** to hold the components of the piston in place on the piston rod. An O-ring seal **102** is disposed between the body **94** and the piston rod **86** to seal the passage between the piston and the rod.

The body of the cylinder **82** is formed by a cylindrical sleeve **83**. The lower end of the cylinder is formed by a threaded insert **104** which includes a suitable sealing ring **106** and a load-bearing bushing **108**. The upper end of the cylinder **82** is formed by a threaded insert **116**. Upper and lower fluid ports **110** and **112** are located in the sleeve **83** above and below the limits of travel of the piston **84**. A conventional source of high-pressure fluid and a valving means for alternatively introducing high-pressure fluid through the ports **110** and **112** are carried by the vehicle **10**, but are not illustrated for simplicity. High pressure may be introduced through port **110** and low pressure fluid exhausted through the port **112** and, alternatively, fluid may be exhausted from the upper port **110** while power fluid is introduced through the lower port **112**.

A mechanism for rotating the cylinder **82** relative to the piston rod **86** and foot plate **88** is comprised of a second rod **114** which extends downwardly through the upper end plug **116** of the cylinder **82** into a bore **122** formed through the piston **84** and piston rod **86**. The rod **114** is keyed to the piston rod **86** to prohibit relative rotational movement yet permit relative longitudinal movement by a square section **118** which extends through a mating square keyway **120** secured in the upper end of the piston rod **86**. Of course the keyed section **118** and keyway **120** may have almost any cross section other than round, and therefore need not be square. The rod **114** is journaled for rotation in the uper end plug **116** and a suitable packing **124** provides a fluid-tight rotary joint. A thrust

bearing **126** is formed by a bearing race **128**, which is connected to the rod **114**, and a bearing race **130** which is connected to the interior face of the end plug **116** of the cylinder and ball bearings indicated in dotted outline between the races. The thrust bearing **128** retains the shaft **114** against the force of the hydraulic pressure acting against the exposed end of the shaft **114** and also lessens the torque required to rotate the cylinder relative to the rods **114** and **86**. A sheave **132** is splined to the upper end of the shaft **114**. A rotary drive motor **134** (see FIGURE 1) is mounted on the cylinder **82**. The motor **134** may be a rotary hydraulic motor. A sheave **138** is splined to the drive shaft and a belt **136** passes around the sheaves **132** and **138** to operatively couple the motor **134** to rotate the cylinder **82**, and therefore the vehicle **10**, about the rod **114**, piston rod **86**, and foot plate **88**.

In the operation of the vehicle **10**, the vehicle is customarily driven in the position illustrated in FIGURES 1, 2 and 3 on the rails **11** of the track. The treads **15** and **16** need only be driven through the conventional differential **42** because the guide wheels **48** and **50** at each end of the vehicle maintain the treads **15** and **16** properly centered over the respective rails even as the vehicle passes around curves.

When a train is approaching, power fluid is applied to the hydraulic actuators **62** and **64** to raise the guide wheels **48** and **50** sufficiently high to clear the tracks **11**, and power fluid is introduced through the upper port **110** and fluid exhausted from lower port **112**. This lowers the piston and the rod **86** until the foot plate **88** contacts the cross ties **12** and raises the vehicle **10** into the position illustrated schematically in FIGURE 5. As the piston **84** lowers, the rod **114** remains coupled to the rod **86** through the square section **118** and keyway **120**. Next the motor **134** is energized to rotate the sheave **138**. Since the sheave **132** is keyed to the piston rod **86** and foot **88**, the cylinder **82** and vehicle **10** are rotated transversely of the rails **11** substantially as illustrated in FIGURE 6. Hydraulic fluid is then exhausted through the port **110** and power fluid introduced through the port **112** to lower the vehicle **10** onto the rails **11** as illustrated in FIGURE 7 and raise the foot plate **88** back to its carried position illustrated in FIGURES 1 and 2. The vehicle is then driven under its own power to a position beside the track as illustrated in FIGURE 8 to permit the oncoming train to pass.

After the train has passed, the vehicle is driven back onto the track as illustrated in FIGRUE 7 until the foot plate **88** is centered between the rails **11**. Then power fluid is again introduced through the upper port **110** to raise the vehicle to the position illustrated in FIGURE 6, and the motor **134** is actuated to rotate the vehicle **10** back to the position illustrated in FIGURE 5. The fluid is then exhausted through the upper port **110** and power fluid introduced through the lower port **112** to lower the vehicle back to the position illustrated in FIGURE 5 and raise the foot plate **88** back to transport position. The guide means **44** and **46** are then lowered between the rails **11** and the maintenance work continued.

Although endless crawler treads have been illustrated in the drawings, and such treads provide important advantages, in accordance with another aspect of the invention, a number of wheels may be used in place of the treads. At least two such wheels would be utilized on each side of the vehicle, and three or more can be used as required in order to support the weight of the vehicle on soft earth and in order to provide the vehicle with the capability of crawling transversely over the tracks so as to position the turntable mechanism **80** between the rails when returning the vehicle to the track as previously described. The periphery of such wheels would have a transverse cross section such as illustrated in FIGURES 9, 10 or 11. Further, such wheels may have rims formed by circular metal plates to which resilient lug portions can be bonded at peripherally spaced points to provide traction in soft earth in addition to cushioning the vehicle as it moves along the rails. Of course, the lug portions also raise the broad flange portions above the obstructions normally encountered.

As previously mentioned, the vehicle **10** need not be steered by a differential drive system as a conventional crawler-type tractor, and is therefore fairly inexpensive. The vehicle **10** may nevertheless be driven and steered over almost any surface. The vehicle **10** will tend to travel in a straight line. To change directions, the vehicle can be momentarily raised and rotated by the turntable mechanism **80** to point the vehicle in the desired direction, then lowered to proceed on the selected course.

From the above detailed description of a preferred embodiment of the invention, it will be appreciated that a highly useful vehicle has been described. The vehicle can be quickly and easily removed from a railroad track at almost any place to permit an oncoming train to pass, and can then be quickly returned to the track to continue maintenance operation. The crawler-type track provides a means whereby the vehicle can be driven onto relatively soft supporting surfaces and provides maximum traction for climbing back up embankments onto the railroad track. Further, the crawler-type tread enables the vehicle to climb over the upstanding rails with relative ease without damaging the track. The turntable mechanism requires a minimum of energy and occupies a minimum amount of vertical space. Although the turntable mechanism is particularly useful in combination with the vehicle described above, it may be used for various other applications. The guide means **44** and **46** permit the vehicle to travel on the rails. Yet the guide means can be raised to clear the rails and other obstructions when the vehicle is being removed from the track.

Although preferred embodiments of the invention have been described in detail, it is to be understood that various changes, substitutions and alterations can be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A maintenance vehicle for a railroad comprising:

(a) a chassis,

(b) a pair of endless crawler treads operatively connected to and disposed on opposite sides of the chassis, said crawler treads being spaced to engage and seat upon the rails of the tracks such that the vehicle travels along the rails,

(c) a prime mover mounted on the chassis connected to drive said crawler treads,

(d) turntable means mounted to said chassis at the center of gravity thereof and operable to selectively raise and support said chassis,

(e) foot plate connected to the lower end of said turntable means,

(f) first power means for raising and lowering said turntable means,

(g) second power means interconnecting said turntable and said chassis for selectively rotating said chassis relative to said turntable, whereby the vehicle may traverse the rails, then be raised, rotated and driven from the track, then driven back onto the track, raised, rotated and lowered back onto the rails.

2. The vehicle defined in claim **1** wherein the turntable means comprises:

(a) a vertically-disposed fluid cylinder rigidly attached to the chassis the axis of which passes through the center of gravity of the vehicle,

(b) a piston reciprocally disposed in the cylinder,

(c) a piston rod connected to the piston and extending downwardly therefrom,

(d) a foot plate connected to the lower end of the piston rod, and

(e) power fluid means connected to the cylinder for alternatively introducing power fluid to the cylinder above the piston to lower the foot plate and raise

the vehicle, and then introducing power fluid to the cylinder below the piston for lowering the vehicle and raising the foot plate.

3. The vehicle defined in claim 2 wherein the means for rotating the vehicle about the rod comprises:
(a) a second rod extending upwardly from the piston through the upper end of the cylinder, and
(b) powered means interconnecting the upper end of the second rod and the cylinder for rotating the cylinder relative to the rod.

4. The vehicle defined in claim 1 further characterized by:
(a) guide means connected to the chassis for engaging the rails and maintaining the treads on the rails as the vehicle travels along the rails, and
(b) means interconnecting the guide means and chassis for raising the guide means out of the way when the vehicle is not traveling along the rails.

5. The vehicle defined in claim 1 wherein the turntable means comprises:
(a) a fluid cylinder having upper and lower fluid ports,
(b) a fluid piston reciprocally disposed in the cylinder for reciprocation between the ports,
(c) a piston rod extending through the lower end of the cylinder,
(d) a foot plate connected to the lower end of the piston rod for engaging the surface supporting the vehicle,
(e) a second rod extending through the upper end of the cylinder, and
(f) powered means interconnecting the second rod and the cylinder for rotating the cylinder relative to the rod.

6. The vehicle defined in claim 1 wherein the turntable means comprises:
(a) a fluid cylinder having upper and lower fluid ports,
(b) a fluid piston reciprocally disposed in the cylinder between the ports,
(c) a piston rod connected to the piston and extending through the lower end of the cylinder,
(d) a foot plate connected to the lower end of the piston rod for engaging the surface supporting the vehicle and lifting the vehicle when power fluid is introduced through the upper port,
(e) a bore extending downwardly through the piston and piston rod along the axes thereof,
(f) a second rod journaled for rotation in the upper end of the cylinder and extending from without the cylinder downwardly into the bore,
(g) key means interacting between the second rod and the piston for preventing relative rotational movement while permitting relative longitudinal movement, and
(h) powered means interconnecting the upper end of the second rod and the cylinder for rotating the cylinder about the second rod.

7. The vehicle defined in claim 1 in which the endless crawler treads are fabricated from a resilient material.

8. A maintenance vehicle as defined in claim 1 wherein each of the endless crawler treads has a transverse cross section characterized by a relatively wide web portion for providing a large load bearing surface on soft earth and a lug portion formed of resilient material extending downwardly therefrom for engaging and traveling on the respective rails, the lug portion being sufficiently narrow to pass between obstructions associated with a standard railroad and sufficiently high to raise the flange portion above obstructions associated with a standard railroad.

9. A maintenance vehicle for a railroad track comprising:
(a) a chassis,
(b) a pair of front sprocket wheels and a pair of rear sprocket wheels,
(c) an endless crawler tread passing around the front and rear sprocket wheels on each side of the vehicle,
(d) a prime mover mounted on the chassis and connected to drive a pair of the sprocket wheels,
(e) a front pair and a rear pair of guide wheels gauged to register with the rails of the track,
(f) front and rear arm means pivotally connecting the front and rear pair of guide wheels to the front and rear ends of the chassis,
(g) front and rear fluid powered means interconnecting the front and rear arm means and the chassis for pivoting the arm means and raising and lowering the respective guide wheels,
(h) turntable means connected to the chassis and aligned with the center of gravity of the chassis for selectively raising and supporting said chassis including a fluid cylinder having upper and lower fluid ports alternatively connected to a source of power fluid,
(i) a piston reciprocally disposed in the cylinder for reciprocal movement between the ports,
(j) a piston rod connected to the piston and extending through the lower end of the cylinder,
(k) a foot plate connected to the lower end of the piston rod for engaging the ground under the vehicle,
(l) a bore extending downwardly through the piston and piston rod along the axes thereof,
(m) a second rod extending downwardly through the upper end of the cylinder into the bore and rotatably journaled in the upper end of the cylinder,
(n) key means interconnecting the second rod and the piston for preventing relative rotational movement while permitting relative longitudinal movement therebetween, and
(o) powered means interconnecting the upper end of the second rod and the cylinder for rotating the cylinder and therefore the vehicle about the piston rod.

10. The maintenance vehicle defined in claim 9 wherein:
the endless crawler treads are gauged to travel on the rails of the track and are fabricated from a resilient material having a hardness less than that of the rails.

11. The maintenance vehicle defined in claim 10 wherein the powered means interconnecting the second rod and the cylinder comprises:
(a) a first sheave splined to the upper end of the second rod,
(b) a rotary motor connected to the cylinder having a drive shaft,
(c) a second sheave splined to the drive shaft of the motor, and
(d) an endless belt coupling the first and second sheaves.

12. A turntable mechanism for raising and rotating vehicles and the like about an axis comprising:
(a) a fluid cylinder having upper and lower fluid ports,
(b) a fluid piston reciprocally disposed in the cylinder between the ports,
(c) a piston rod connected to the piston and extending through the lower end of the cylinder,
(d) a foot plate connected to the lower end of the piston rod for being lowered to engage the surface supporting the vehicle and to support the vehicle in a raised position when power fluid is introduced through the upper port,
(e) a bore extending downwardly through the piston and piston rod along the axes thereof,
(f) a second rod journaled for rotation in the upper end of the cylinder and extending from without the cylinder downwardly into the bore,
(g) key means interacting between the second rod and the piston for preventing relative rotational movement while permitting relative longitudinal movement, and

(h) powered means interconnecting the upper end of the second rod and the cylinder for rotating the cylinder about the second rod.

13. The turntable mechanism defined in claim **12** further characterized by a thrust bearing disposed between the second rod and the upper end of the cylinder for resisting the fluid force tending to expel the second rod from the cylinder.

14. The turntable mechanism defined in claim **12** wherein the powered means comprises:

(a) a first sheave splined to the upper end of the second rod,

(b) a rotary motor connected to the cylinder having a rotary drive shaft,

(c) a second sheave splined to the drive shaft, and

(d) an endless flexible drive member passing around the first and second sheaves.

15. A maintenance vehicle for a railroad comprising:

(a) a chassis,

(b) a plurality of support wheels having a traverse cross section characterized by a relatively wide web portion for providing a large load bearing surface on soft earth and a lug portion formed of resilient material extending downwardly therefrom for engaging and traveling on the respective rails, the lug portion being sufficiently narrow to pass between obstructions associated with a standard railroad and sufficiently high to raise the flange portion above obstruction associated with a standard railroad,

(c) a prime mover mounted on the chassis and connected to drive at least one of the wheels,

(d) turntable means mounted to the chassis having a foot disposed at the center of gravity of the chassis, rod means for lowering the foot to the ground and raising the vehicle while supported by said foot until the wheels clear the rails, and means for rotating the vehicle about the rod means,

(e) whereby the vehicle may traverse the rails for normal maintenance work, then be raised, rotated and driven from the track to permit a train to pass, then driven back onto the track, raised, rotated and lowered back onto the rails to continue the maintenance work.

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