Sept. 12, 1933. J. M. PIERCE 1,926,309

LOADING, UNLOADING, AND CONVEYING MACHINE

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Fig. 1.

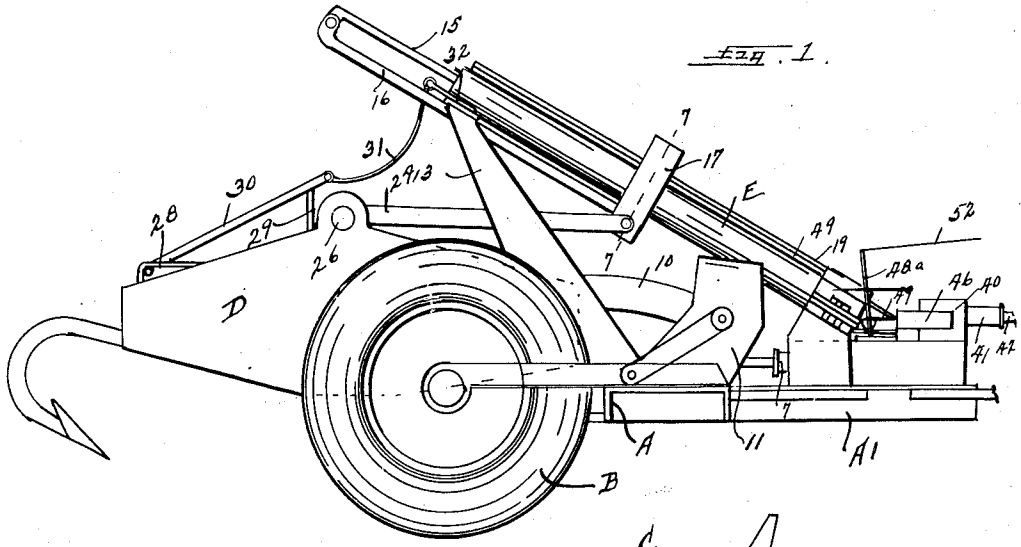
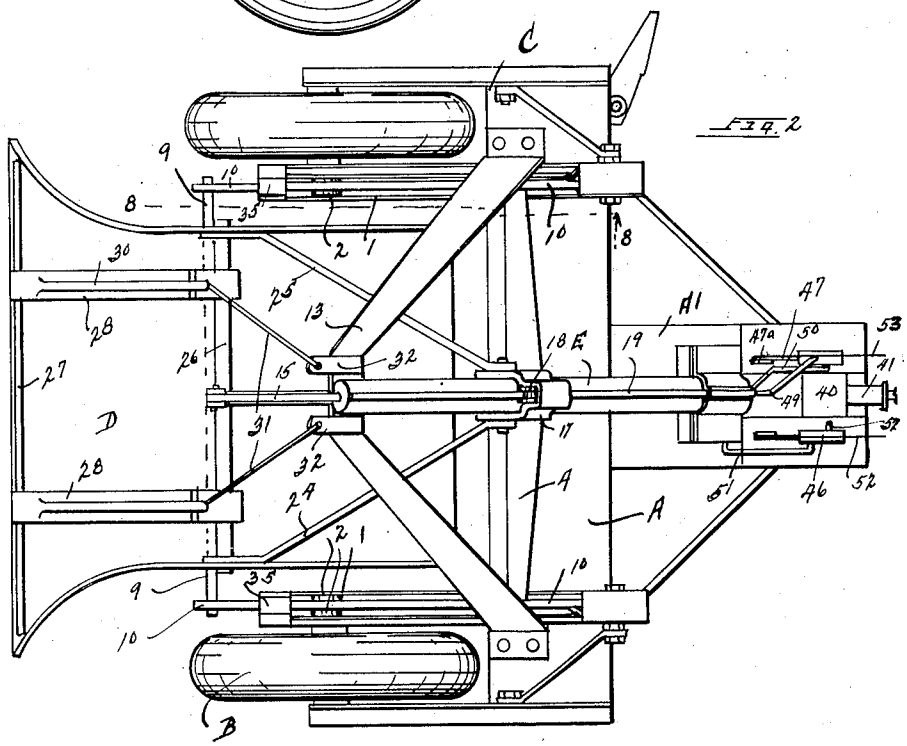


Fig. 2.



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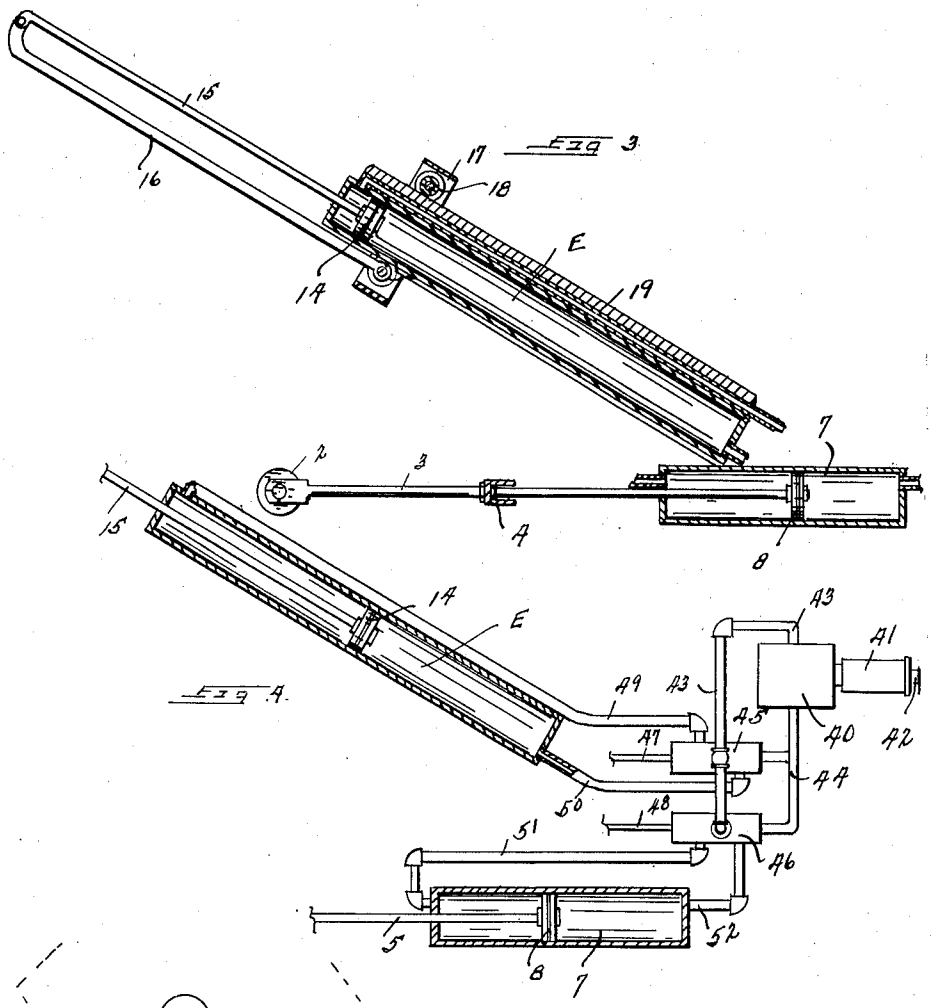


Fig. 3.

Fig. 4.

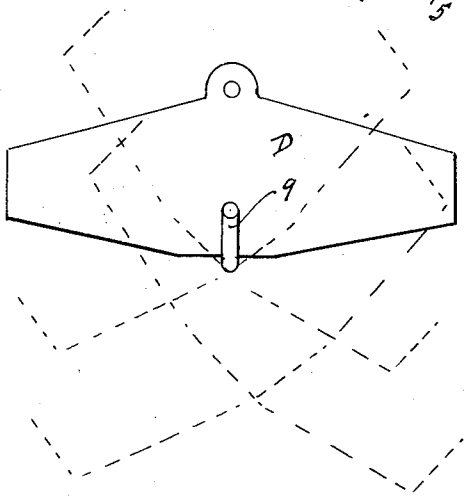


Fig. 10.

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LOADING, UNLOADING, AND CONVEYING MACHINE

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Fig. 5.

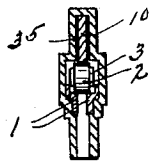


Fig. 6.

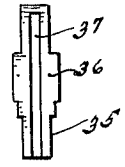


Fig. 7.

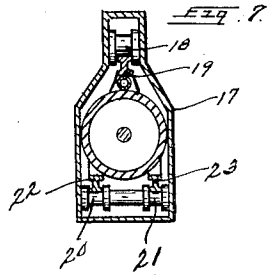


Fig. 8.

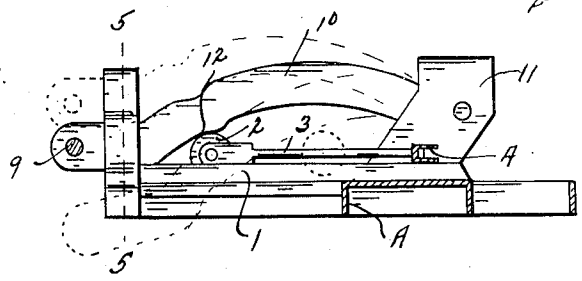
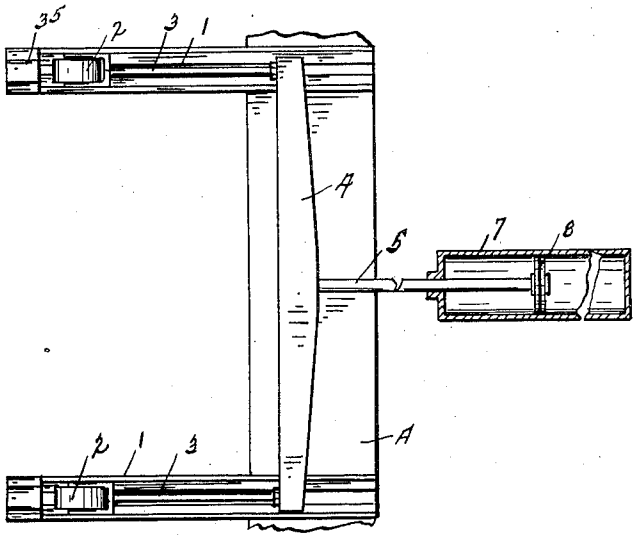


Fig. 9



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Patented Sept. 12, 1933 1,926,309

UNITED STATES PATENT OFFICE

1,926,309

LOADING, UNLOADING, AND CONVEYING MACHINE

James M. Pierce, Ogden, Utah, assignor of one-half to Ora Bundy, Ogden, Utah

Application June 7, 1932. Serial No. 615,806

5 Claims. (Cl. 37—4)

My invention relates to loading, unloading and conveying of dirt, gravel or rock and has for its object to provide a device to be attached to any power unit such as a tractor, or truck, which device will load the body thereof in either the forward travel or rearward travel, and which will dump either forward or rearward as desired.

A further object is to provide a conveyor which may be used to load reasonably sized rock by backing up to them and then forcing the conveyor body thereunder by the power of the truck or tractor which is operating the device.

A still further object is to provide a road working machine which will be powered by truck or tractor and which may be turned quickly and easily in little space, which will be provided with pneumatic tires to eliminate road jars so that the device may be conveyed at high speed without any harm to any working parts.

A still further object is to provide a conveyor body which is provided with an end gate in the bucket to hold material therein when traveling over the road and which end gate is automatically raised when the rear end of the body is lowered either for loading or dumping.

A still further object is to provide a conveyor, scraper, loader, plow and dumping machine which is powered by truck or tractor and which has the bucket or scoop body thereof tilted, raised or lowered by hydraulic cylinders through which oil is pumped, and controlled by the driver of the truck, thereby eliminating the need of help in handling the device, one man being all that is required to perform the several operations of the device.

A still further object is to provide a road working machine having means to secure a single plow or a series of plows thereto to be operated by forward movement of the machine and which may be kept thereon while the device is being used in certain jobs where it is desired to break ground, load from the front, and dump over an embankment from the rear.

A still further object is to provide a road working machine having a rooter attached thereto, said rooter to break down side walls of a cut, preparatory to loading it into the body of the device.

These objects I accomplish with the device illustrated in the accompanying drawings in which similar numerals and letters of reference indicate like parts throughout the several views and as described in the specification forming a part of this application and pointed out in the appended claims.

In the drawings in which I have shown the best and most preferred manner of building my invention

Figure 1 is a side view of the machine.

Figure 2 is a plan view thereof.

Figure 3 is a diametrical section of the two power cylinders.

Figure 4 is a diagrammatic view of the hook up of the power cylinders with the oil pump and control valves.

Figure 5 is a section on line 5—5 of Figure 8.

Figure 6 is an end view of the guide for the body support beams.

Figure 7 is a section on line 7—7 of Figure 1.

Figure 8 is a section on line 8—8 of Figure 2.

Figure 9 is a plan view of the elevating means for raising the body.

Figure 10 is a diagrammatic view of the body showing by dotted lines the various positions obtainable.

In the drawings I have shown my device as mounted on a frame work A with the wheels B set in spaced apart support members C on each side thereof with the wheels B of the rubber or pneumatic type, preferably. The frame work A is of a U-shape with the wheels mounted in the ends of the U, and with an extension A1 on the front end thereof by which the entire device is attached to the power medium.

The ends of the U are bifurcated to form bearings for the shafts or axles of the wheels and along each inner side of the U legs I secure spaced apart parallel pairs of angled tracks 1 upon which rollers 2 operate. Each roller 2 is attached to a control arm 3 and the control arm is attached to a cross bar 4. The center of the bar 4 is attached to a connecting rod 5 which has the front end extended into a cylinder 7 and attached to a piston 8. Thus when the piston is actuated forward and backward in the cylinder, the rollers are moved forward and back over the tracks. This is to raise and lower the scoop or conveyor body D of the machine, and the body D is made with a cross support bar 9 extending across the bottom of the body and up each side a short distance where it is then bent outwardly as a support for the body, and as a pivot point or fulcrum on which the body is operated. Onto each end of the support bar 9 I then attach control and support beams 10, which beams are pivotally supported from the front end of each side of the frame A by support brackets or blocks 11 raised above the level of the frame A. The beams 10 are curved so that the rear end of the beam is on a lower level than

the front when the device is in the lowest position, but on approximately the same level when the scoop is raised. The lower edge of the beams 10 are resting upon the top side of the rollers 2 at all times and the rear or front position of the rollers, determines the raised or lowered position of the body. A short flat space 12 is provided in the beams at that position which will hold the device in the half raised position as desired for conveying.

From near each end of the frame A I mount the legs of an inverted V-shaped support 13 with the medial portion or apex of the V straightened out to provide a space on which the upper end of a hydraulic cylinder E is mounted. The hydraulic cylinder E carries a piston 14 therein and from the top end thereof a connecting rod 15 is extended with the end of the rod 15 attached to a link bar 16. Surrounding the cylinder I then provide a sliding bracket 17, with the top end of the bracket carrying a support roller 18 therein, said roller to engage and ride on a rail 19, which rail is secured directly over the hydraulic cylinder E, but spaced slightly thereabove. The two lower ends of the bracket carry rollers 20 and 21 which rollers engage the under sides of guide rails 22 and 23, which rails are secured under, but spaced from the cylinder E. Thus when the piston is operated up and down the cylinder, this bracket is moved up and down the outside of the cylinder. From this bracket running to the top of each side of the body D I provide actuating arms 24 and 25 pivotally attached to the bracket and to a cross brace 26 of the body D.

An end gate 27 is provided for the rear end of the body D and the said gate is supported from two spaced apart brackets 28 with the front end of the brackets extended forward and secured pivotally on the cross brace 26 of the body D. Extending upward from the brackets 28 near the braces 26 I provide vertical bars 29 and from said bars leading down to the beams near the end gate I provide rods 30, said rods secured onto the top end of the bars 29 and extended therebeyond and having a looped end in said rods into which actuating cables or chains 31 are attached. The other end of the cables are attached to the top end of the supports 13 by members 32 secured thereto. The gate 27 remains closed at all times except when the body is tilted rearwardly at which time the cables 31 tighten and pull on the bars 30 and as the body continues to tilt rearwardly taking the slack out of the cables they actuate the arms 29 and rods 30 and draw the gate 27 upwardly away from the bottom of the body D, so that the body may be either loaded or dumped from the rear.

Onto the ends of the tracks 1, I then secure guide members 35 which are to guide the beams 10 in their up and down movements on the rear end to keep the body from side motions. These guides 35 are formed U-shaped at the top and are then bent out and down to allow the rollers 2 to operate therebetween and are then bent in to engage the tracks 1 and are secured thereto. The rear ends of the members 35 are closed by plates 36 with slots 37 therein in which slots the beams operate.

Onto the portion A1 of the frame A, I mount a pump 40 having a power connection 41 to and into which the power take off drive shaft 42 from the tractor or truck is placed to drive the pump from the motor of the hauling and powering vehicle. Leading from the pump I provide a lead line 43 to control valves 45 and 46 and a pipe 44 leads into the valves from the opposite side of the pump. The valves are provided with control rods 47 and 48 to shift the valve elements therein to control the flow of fluid in the direction desired. The valve 45 is connected with the power cylinder E by lines 49 and 50, the line 49 leading into the top end of the cylinder and the line 50 into the bottom end thereof to drive the piston 14 in either direction in the cylinder desired by shifting the valve and directing the fluid into either end of the cylinder desired.

Leading from the valve 46 I provide lead lines 51 and 52 to ends of the cylinder 7 to control the movement of the piston 8 therein, thus providing means for power actuating the cylinders from the draft vehicle.

The operation of the device is as follows:

The driver wishing to load from the rear actuates the cylinder E by directing fluid through the pipe 50 and driving the piston 14 up the cylinder, thereby tilting the body back, he then lowers the body to the work by actuating the piston 8, drawing the piston forward in the cylinder by forcing fluid through the line 51. The driving vehicle is then backed until the body is filled and the body is then raised to the horizontal position by forcing fluid through the line 49 until the body is horizontal. It may then be elevated for carrying, by actuating the piston 8 until the rollers 2 rest under the portions 12 of the arms 10.

To dump the loaded body the driver actuates the cylinder E in either direction desired to dump from the front or rear as desired.

The loading from in front is accomplished with similar methods.

Having thus described my invention I desire to secure by Letters Patent and claim:

1. In a device of the class described the combination of a frame work; rails carried thereon; rollers operating on said rails; a conveyor body pivotally supported rearwardly from the front end of said frame work by beams, said beams resting upon the top side of said rollers and the elevation of said beams and body to be regulated by the forward or rearward position of said rollers; means to control the forward or rearward position of said rollers; means to support a hydraulic cylinder carrying a piston therein, above said frame work at an acute angle thereto; guide rails supported from said cylinder; a bracket carried by suitable rollers operating on said guide rails, said bracket attached to the operating piston in said cylinder by a link bar and connecting rod; and control levers attached to said bracket and to said body to tilt the body into any desired position by the operation of said hydraulic cylinder.

2. In a road working machine the combination of a frame work; a conveyor body carried therebetween; pneumatic tired wheels on which said frame work is supported, one on each side thereof; means to raise and lower said body; means to tilt said body rearwardly to load material thereinto or dump material therefrom as the machine is backed up and to tilt said body forward to load material thereinto or dump material therefrom as the machine is moved forward; and means to hold said body in a horizontal position during the transportation.

3. In a hydraulically operated body for loading and conveying machines, the combination of a frame work; a body supported therein; curved beams pivoted to said framework onto the free end of which beams said body is pivotally secured;

tracks on said framework; rollers operating on said tracks supporting said curved beams; means to move rollers forward or backward on said tracks under said beams to raise or lower said body; and means including hydraulic cylinder linked to the top of said body, to tilt said body forward or backward as desired.

4. In a road working machine the combination of a frame work; wheels to support said frame work, said wheels operating on pneumatic tires; a set of tracks mounted on said frame work; rollers carried on said tracks; curved beams carried above said framework with the front end pivoted to said framework; a conveyor body mounted at the free end of said pivoted curved beams, said beams resting on said rollers; means to raise or lower said body by moving said rollers forward or backward as desired; a hydraulic cylinder mounted above said frame work at an angle thereto; means linking said cylinder with said body to tilt said body by the power of said cylinder; an end gate in said body pivotally mounted in the middle of said body by support arms; and cables attached to said arms and near the end of said cylinder to raise said end gate when the body is tilted rearwardly.

5. In a device of the class described the combination of a U-shaped framework; pneumatic tires mounted in each leg of the U-shaped framework; a conveyor body carried between the legs of said framework; a hydraulic cylinder linked to said body to tilt said body forward or backward; tracks mounted on each leg of said framework; curved beams pivotally secured to said framework and said body; rollers operating on said tracks engaging and actuating said beams, the movement of the rollers to raise and lower the body; and a hydraulic cylinder linked to said rollers to move them forward and backward on said tracks.

JAMES M. PIERCE.