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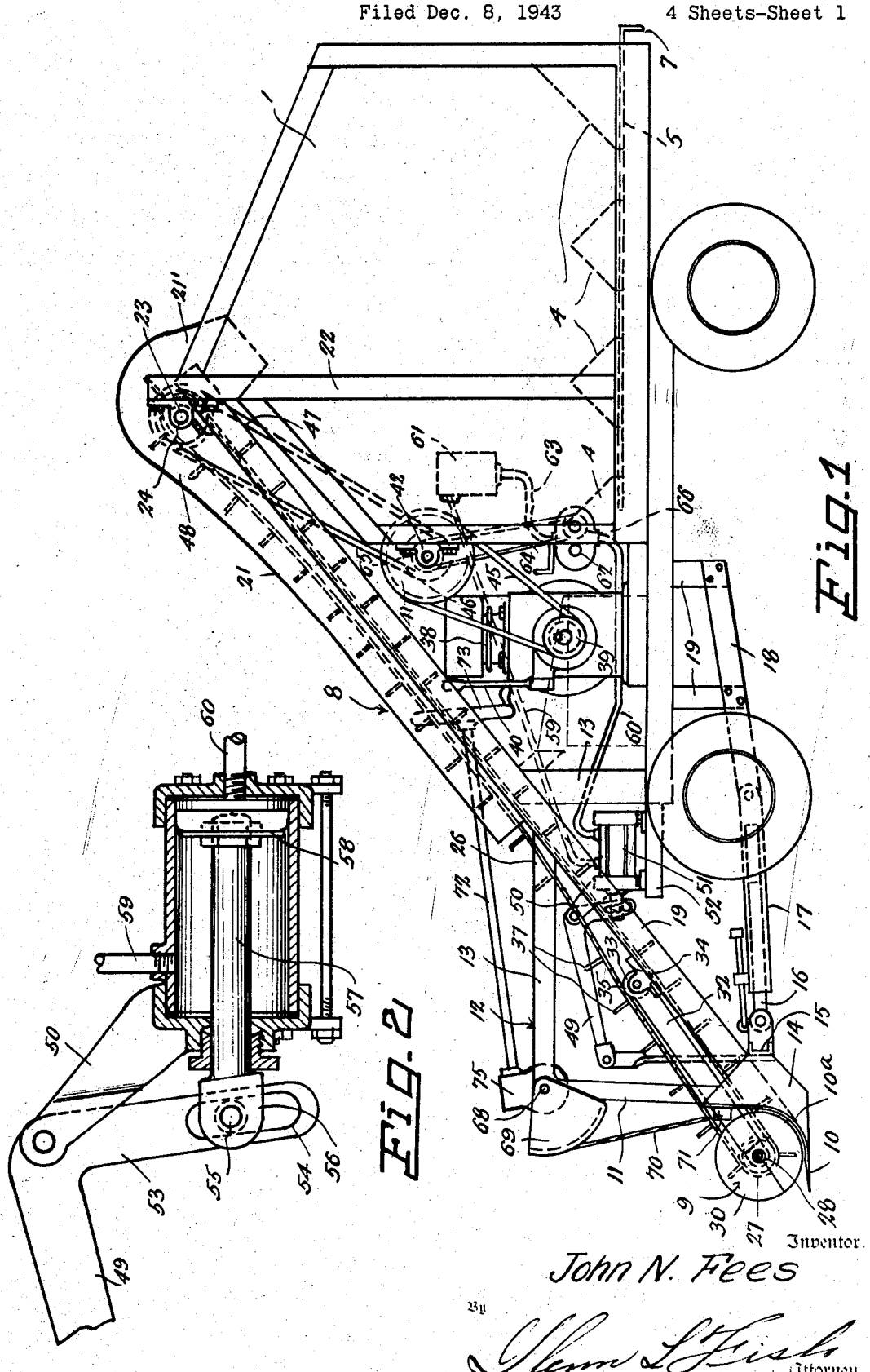


Fig. 1

Fig. 2

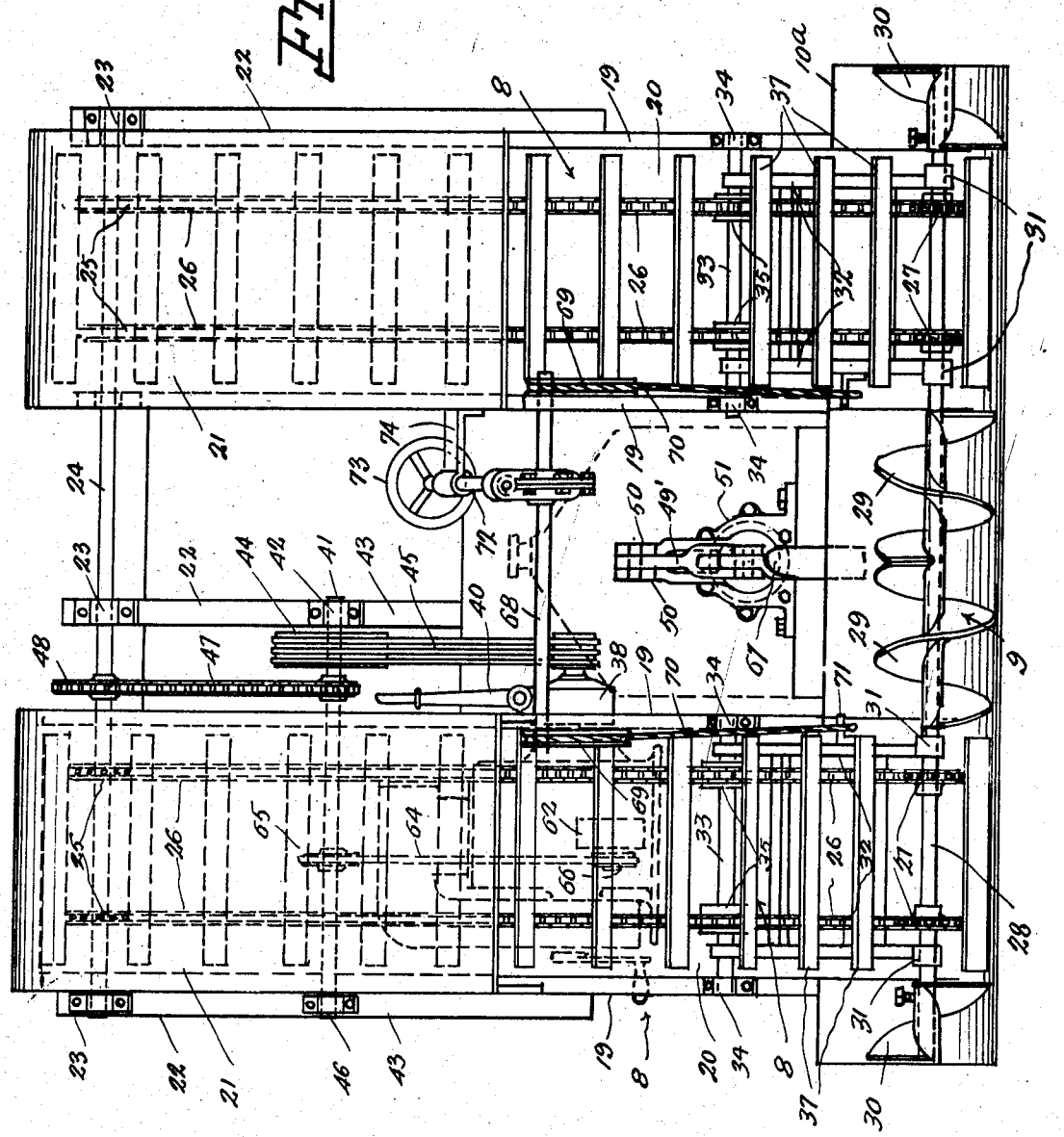
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Fig. 3



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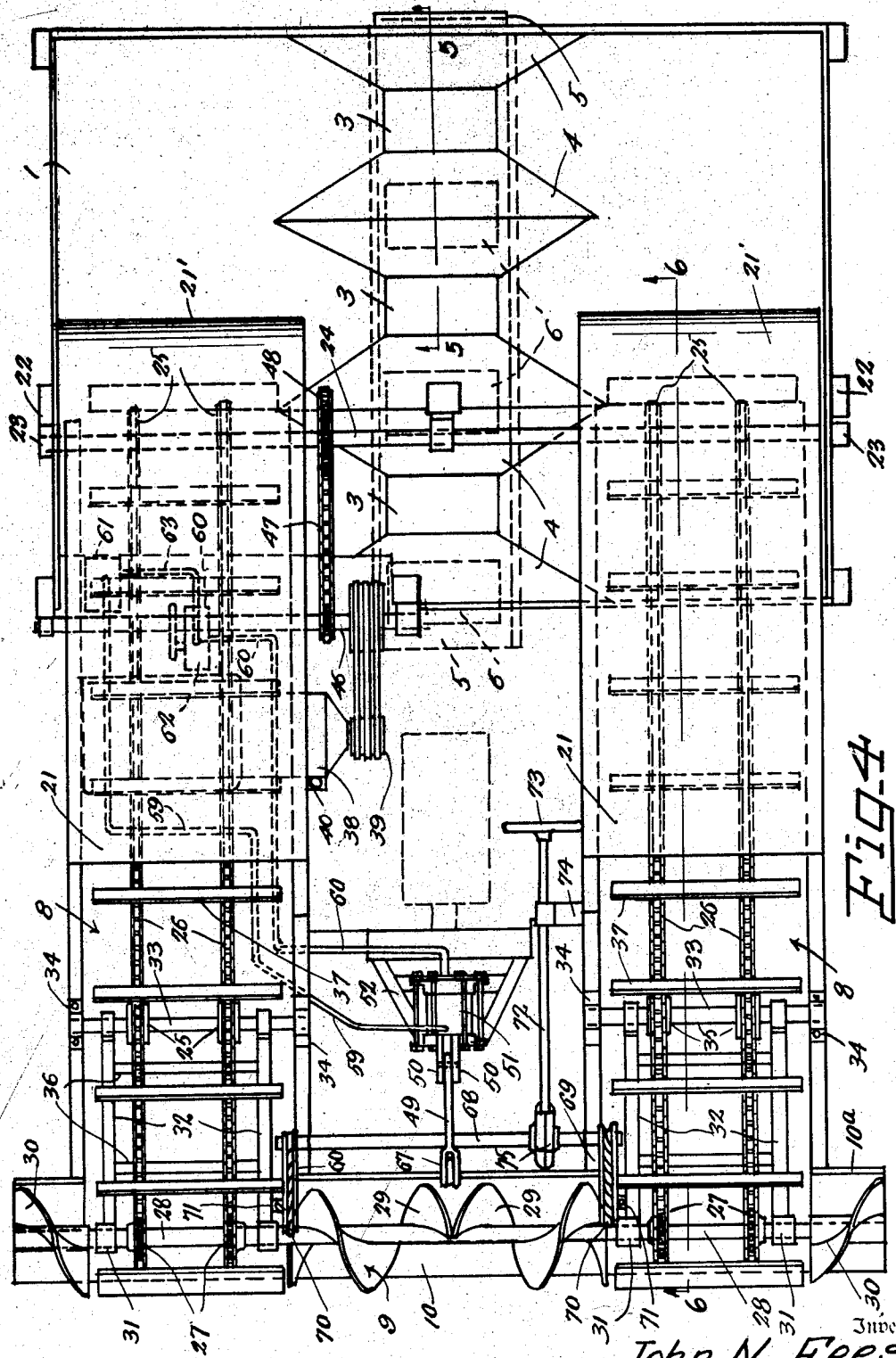


Fig. 4

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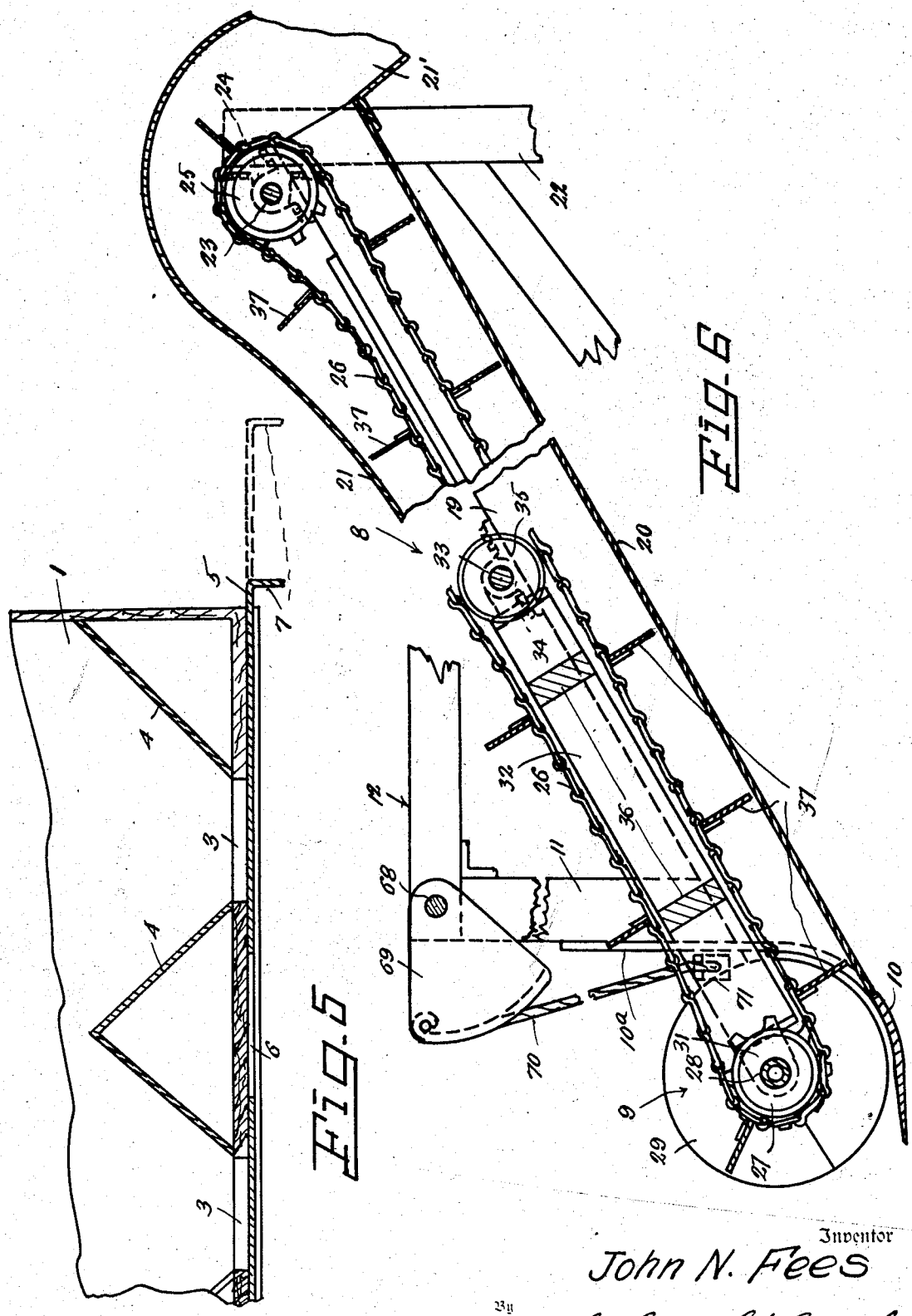


Fig. 6

Fig. 5

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Application December 8, 1943, Serial No. 513,385

6 Claims. (Cl. 214—83)

This invention relates to loaders and more particularly to a loader for removing grain, coal, sawdust, and the like from a pile upon a floor or the ground and depositing same in an elevator, bin, truck, or other place or vehicle.

One object of the invention is to provide a loader including a portable frame having means at its front for removing grain or the like from a pile and delivering same to conveyors extending rearwardly at an upward incline for elevating the material and depositing same in a receptacle or body occupying the rear portion of the truck chassis.

Another object of the invention is to provide a loader having the means at its front for removing grain from a pile consisting of horizontally disposed screw conveyors and a cooperating blade, thus forming a wide structure adapted to be thrust into the lower marginal portion of a pile and feed grain therefrom to lower ends of upwardly inclined conveyors.

Another object of the invention is to provide supporting means for the conveyors and the blade, of such formation that the blade and associated conveyors may be shifted vertically to adjusted positions when necessary.

Another object of the invention is to provide adjusting means for the blade and conveyors actuated by a piston operating in a cylinder to which fluid is delivered according to the direction in which the piston must be moved to raise or lower the blade and associated conveyors.

Another object of the invention is to provide a loader having a blade and manually operated mechanism for tilting the blade to angularly adjusted positions.

Another object is to provide a loader which is very efficient in operation and by means of which a large quantity of grain or other material may be quickly removed from a pile.

In the accompanying drawings:

Fig. 1 is a side elevation of the improved loader.

Fig. 2 is a fragmentary view showing the fluid operated means for vertically shifting the blade and associated conveyors.

Fig. 3 is a front view of the loader.

Fig. 4 is a top plan view of the loader.

Fig. 5 is a fragmentary sectional view on the line 5—5 of Fig. 4.

Fig. 6 is a sectional view taken longitudinally through a conveyor on the line 6—6 of Fig. 4.

This improved loader is employed for removing grain or other free flowing material from a pile and transporting same to a grain elevator or other destination and includes a bin or receptacle 1 carried by the chassis of a truck 2 which may be of any size found suitable and will be equipped with the usual engine and control mechanism. The bin or receptacle projects rearwardly from the truck and its bottom is formed with a plurality of openings 3 through which grain passes when flowing from the bin. Guides 4 are carried by the bottom of the bin for directing material through the outlet openings and, in order to close the outlets, there has been provided a closure plate or strip 5 which is mounted for longitudinal sliding adjustment under the bottom and formed with openings 6 for registering with the outlets when the closure is in open position. By grasping the depending hand hold 7 at the rear end of the closure, it may be easily shifted to open or closed position.

The mechanism for delivering material to the bin includes conveyors 8 and 9 and a trough or blade 10, the conveyors 8 extending rearwardly from the conveyor 9 at an upward incline at opposite sides of the machine and the conveyor 9 being disposed in front of and over the trough 10 so that when the blade or forward portion of the trough is thrust into a pile of material, the conveyor 9 may shift the material longitudinally of the trough and deliver same to the lower front ends of the conveyors 8. The blade or trough 10 is formed of strong sheet metal and has an upwardly extending apron 10a at its rear which bears against vertical posts 11 of frames 12 disposed at opposite sides of the truck or carriage 2 and having horizontal bars extending rearwardly from upper ends of the posts 11 and secured to upstanding posts 13 at forward corners of the truck chassis 2. Braces 14 extend rearwardly from opposite ends of the trough 10 and its apron and are secured to a cross bar 15 pivoted at its ends to rods 16. These rods are slidably received in bars 17 which are pivoted at their rear ends to bars or beams 18 carried by hangers 19 under the chassis of the truck. It will thus be seen that the trough 10 may be shifted vertically to adjusted positions.

The conveyors 8 have troughs provided with side bars 19 and bottoms 20 which are formed of sheet metal and, for a portion of its length, each trough is provided with a hood 21 extending to the top of the trough and extended downwardly to form a spout 21' through which the grain or other material is discharged into the bin 1. Uprights or posts 22 support the rear ends of the troughs and carry bearings 23 through which a shaft 24 is rotatably mounted. This shaft carries sprocket wheels 25 about which are

trained the endless sprocket chains 26 of the conveyors. The chains 26 extend longitudinally of the troughs and, at their lower ends, are trained about sprocket wheels 27 carried by a shaft 28 which extends longitudinally of the trough 10 and constitutes a shaft for the conveyor 9. The conveyor 9 consists of a plurality of screw conveyors 29 and 30 which are carried by the shaft 28, and attention is called to the fact that the screws 29 are disposed between the conveyors 8 whereas the screws 30 are disposed outwardly of the conveyors 8. The helical blades of the screws are pitched in opposite directions, as shown in Fig. 3, so that the two screws 29 feed grain toward the two conveyors 8 and the screws 30 feed grain inwardly of the trough 10 toward the conveyors 8 with which they cooperate. The shaft 28 is rotatably mounted in bearings 31 at the front ends of bars 52 which extend longitudinally in the troughs of the conveyors 8 and at their rear ends are pivotally mounted by shafts 33 carried by bearings 34 mounted on the side bars 19 of the conveyor troughs. The shafts 33 also carry rollers 35 for separating upper and lower flights of the sprocket chains 26 and guiding movement thereof during operation of the conveyors. Cross bars 36 hold the bars 32 spaced from each other transversely of the conveyor troughs 20. Blades 37 are carried by the sprocket chains 26 and when the conveyors 8 are in motion, these blades serve to move grain upwardly along the bottoms of the troughs 20 to the spouts 21'.

In order to operate the conveyors 8, there has been provided a power unit 38 which is mounted on the truck transversely thereof and is provided with a pulley 39 and having a gear shift controlled by the usual lever 40, so that the speed at which the pulley rotates may be regulated. A shaft 41 is rotatably mounted through bearings 42 carried by posts or uprights 43 and this shaft carries a pulley 44 in order that rotary motion may be transmitted to shaft 41 by a belt or belts 45 trained about the pulleys 39 and 44. A sprocket wheel 46 is also carried by the countershaft 42 and about the sprocket wheel is trained a chain 47 which extends upwardly and is trained about a sprocket wheel 48 carried by the shaft 23. Since the pulley 41 is of appreciably greater diameter than the pulley 39, a speed reduction will be accomplished and the propellers 8 and 9 will be operated at a desired speed, the conveyors 8 being driven from the shaft 24 and the conveyor 9 by the chains 26 and sprockets 27.

During use of the loader, it is desired to vertically adjust the scoop or trough 10 so that it may enter a pile of grain at the floor level or at any other desired level. It is also at times necessary to raise the scoop in order to compensate for sliding of the grain. To do this, there has been provided a lever 49 which extends longitudinally of the truck and projects from the front end thereof midway its width. This lever is pivotally mounted between arms 50 projecting forwardly from a cylinder 51 mounted on a bracket 52, and, at its inner rear end, the lever is formed with a depending arm 53 formed with a slot 54 in its lower portion to receive a pin 55 carried by a clevis 56 at the front end of a piston rod 57. The piston rod projects forwardly out of the cylinder 51 and, at its rear end, is fixed to a piston 58 which is shiftable longitudinally in the cylinder by water, oil, or other fluid medium which enters and leaves the cylinder through pipes 59 and 60. The pipe 59 communicates with the upper end of a reservoir 61 and pipe 60 communicates with a rotary pump 62, a pipe 63 being provided for connecting the pump with the lower end of the reservoir. The pump is driven from the shaft 41 by a belt 64 trained about a pulley 65 carried by the shaft, and a pulley 66 carried by the shaft of the pump. By adjusting the valve or valves of the pump, the direction in which it operates may be controlled and the liquid delivered to the cylinder in such manner that the piston will be shifted either forwardly or rearwardly in the cylinder. When the piston is moved in the cylinder the lever 49 will be tilted about the pin 55 and scoop 10 will be shifted vertically through the medium of a bar 67 pivoted at its upper end to the front end of the lever and having its lower end fixed to the scoop midway the ends thereof. Since the piston is moved by hydraulic pressure, the scoop and forward end portions of the conveyors 8 may be quickly shifted vertically.

It is also desired to permit the shaft and the screws of the conveyor 9 to be shifted vertically and disposed in proper position for cooperation with the scoop 10. In order to do so, there has been provided a shaft 68 which is rotatably mounted transversely of the loader between forward corners of the frames 12. This shaft carries quadrants 69 to which cables 70 are attached, the cables extending downwardly and having their lower ends connected to lugs or brackets 71 carried by inner ones of the arms or bars 32. When the shaft 70 is turned the cables will be shifted longitudinally and the shaft 28 and screws carried thereby raised or lowered to dispose the screws in proper relation to the scoop. A shaft 72 which extends longitudinally of the loader and has a wheel 73 at its rear end, is rotatably mounted through a bearing bracket 74 and has its front end rotatably received in a gear housing 75 which is also mounted about the shaft 68 and encloses a worm and worm gear so that when the shaft 72 is rotated, rotary motion will be imparted to the shaft 68 and the quadrants 69 swung vertically to raise or lower the bars 32 and shaft 28. It will thus be seen that the screws 29 and 30 may be vertically adjusted and disposed in such relation to the scoop that grain will be moved along the scoop during operation of the conveyor 9 and onto lower ends of the conveyors 8. The conveyor 9 will, therefore, operate very efficiently to remove grain from a pile and deposit it upon conveyors 8 which carry it upwardly and deliver it to the bin 1.

Having thus described the invention, what is claimed is:

1. In a loader, a carriage, a frame carried by said carriage and extending upwardly therefrom, conveyors carried by said frame and extending longitudinally of the carriage in transverse spaced relation to each other and having forward portions projecting from the carriage, means for driving said conveyors including a power unit and a shaft rotated thereby, an auxiliary frame under said carriage having a portion projecting forwardly from the carriage, a scoop extending horizontally between and outwardly from front ends of the conveyors, a cylinder carried by said carriage, a piston in said cylinder having a rod extending from an end of the cylinder, a lever pivotally mounted and connected with the scoop and with the piston rod for actuation thereby, a pump driven by said

shaft and connected with said cylinder for delivering fluid under pressure to the cylinder and moving the piston to actuate said lever, screw conveyor in front of said scoop extending longitudinally thereof and actuated from the longitudinal conveyors for delivering material to the longitudinal conveyors, and means for shifting the screw conveyor to vertically adjusted positions.

2. In a loader, a carriage, a frame extending upwardly from said carriage, conveyors spaced from each other transversely of the carriage and extending longitudinally thereof at an upward incline toward their rear ends and having forward portions projecting from the carriage, a shaft rotatably supported by said frame and extending transversely through upper ends of the conveyors to pivotally mount the same and actuate the conveyors, a scoop extending horizontally at front ends of said conveyors, an auxiliary frame under said carriage having bars pivoted at their rear ends and extending forwardly from the carrier and pivotally connected with said scoop to mount the scoop and the troughs for vertical adjustment, means for shifting the scoop and troughs vertically to adjusted positions including a cylinder and a piston shiftable longitudinally therein, a power unit, means for driving said power unit including a countershaft, means for supplying fluid under pressure to said cylinder including a pump driven from said countershaft, a conveyor disposed horizontally in front of said scoop, and means for shifting the horizontal conveyor to vertically adjusted positions.

3. In a loader, a carriage, a frame extending upwardly from said carriage, conveyors spaced from each other transversely of the carriage and extending longitudinally thereof at an upward incline toward their rear ends and having forward portions projecting from the carriage, said conveyors having troughs and endless carriers extending longitudinally therein, a shaft rotatably supported by said frame and extending transversely through upper ends of the troughs to pivotally mount same, sprockets carried by said shaft in the troughs for imparting movement to the endless carriers, a scoop extending horizontally at front ends of said troughs, an auxiliary frame under said carriage having bars pivoted at their rear ends and extending forwardly from the carriage and connected with said scoop to mount the scoop and the troughs for vertical adjustment, means for shifting the scoop and troughs vertically to adjusted positions, a horizontal conveyor cooperating with said scoop and having a shaft extending longitudinally of the scoop in front of the same, arms extending longitudinally in the forward portions of said troughs and pivotally mounted at their rear ends, bearings at front ends of said arms rotatably carrying said horizontal shaft, sprockets carried by the horizontal shaft, the endless carriers being trained about the sprockets of the horizontal shaft, helical blades carried by the horizontal shaft and cooperating with the scoop for delivering material to lower front ends of the conveyor troughs when rotating, an adjusting shaft rotatably mounted above forward portions of the first conveyors, quadrants carried by said adjusting shaft, cables carried by said quadrants and connected with said arms, and an operating shaft rotatably mounted and geared to the adjusting shaft for rotating the adjusting shaft and shifting the arms and horizontal shaft vertically to adjusted positions.

4. In a loader, a carriage, a frame extending upwardly from said carriage, conveyors spaced from each other transversely of the carriage and extending longitudinally thereof at an upward incline toward their rear ends and having forward portions projecting from the carriage, said conveyors having troughs and endless carriers extending longitudinally therein, a shaft rotatably supported by said frame and extending transversely through upper ends of the troughs to pivotally mount the same, sprockets carried by said shaft in the troughs for imparting movement to the endless carriers, a scoop extending horizontally at front ends of said troughs, a power unit on said carriage, a countershaft rotated from said power unit, means for transmitting rotation from the countershaft to the first shaft, arms extending longitudinally in forward portions of said troughs and pivoted at their rear ends, a propeller shaft extending longitudinally of the scoop in front thereof, a helical screw carried by the propeller shaft, sprockets carried by the propeller shaft and engaged by the endless carriers for rotation of the propeller shaft from the endless carriers, a cylinder carried by said carriage, a piston in said cylinder having a rod projecting forwardly from the cylinder, a lever pivotally mounted at the front of the cylinder and engaged with the piston rod for actuation thereby, said lever being connected with said scoop, means actuated from the countershaft for delivering fluid under pressure to the cylinder and moving the piston to actuate the lever and vertically adjust the troughs and the scoop, and means for shifting the propeller shaft and helical screw vertically with respect to the scoop.

5. In a loader, a carriage, conveyors spaced from each other transversely of the carriage and extending longitudinally thereof at an upward incline toward their rear ends and having forward portions projecting from the carriage, said conveyors having troughs and endless carriers extending longitudinally therein, a shaft rotatably supported and extending transversely through upper ends of the troughs to pivotally mount the same, sprockets carried by said shaft in the troughs for imparting movement to the endless carriers, a scoop extending horizontally at front ends of said troughs, a power unit on said carriage, a countershaft rotated from said power unit, means for transmitting rotation from the countershaft to the first shaft, arms extending longitudinally in forward portions of said troughs and pivoted at their rear ends, a propeller shaft extending longitudinally of the scoop in front thereof, a helical screw carried by the propeller shaft, sprockets carried by the propeller shaft and engaged by the endless carriers for rotation of the propeller shaft from the endless carriers, a cylinder carried by said carriage, a piston in said cylinder having a rod projecting from the cylinder, a lever pivotally mounted and engaged with the piston rod for actuation thereby, an arm rising from the scoop and pivoted to said lever, a pump actuated from the countershaft, a reservoir, pipes connecting said pump with the reservoir and one end of the cylinder, and a pipe connecting the reservoir with the other end of the cylinder.

6. In a loader, a carriage, conveyors spaced from each other transversely of the carriage and extending longitudinally thereof at an upward incline toward their rear ends and having forward portions projecting from the carriage, said conveyors having troughs and endless carriers

extending longitudinally therein, a shaft rotatably supported and extending transversely through upper ends of the troughs to pivotally mount the same, sprockets carried by said shaft in the troughs for imparting movement to the endless carriers, a scoop extending horizontally at front ends of said troughs, a power unit on said carriage, a countershaft rotated from said power unit, means for transmitting rotation from the countershaft to the first shaft, arms extending longitudinally in forward portions of said troughs and pivoted at their rear ends, a propeller shaft extending longitudinally of the scoop in front thereof, a helical screw carried by the propeller shaft, sprockets carried by the propeller shaft and engaged with the endless carriers for rotation of the propeller shaft from the endless carriers, and fluid actuated means for shifting the troughs and scoop to vertically adjusted positions including a pump driven from the countershaft and having a valve for reversing flow of fluid and controlling raising and lowering of the conveyors.

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