

Nov. 1, 1955

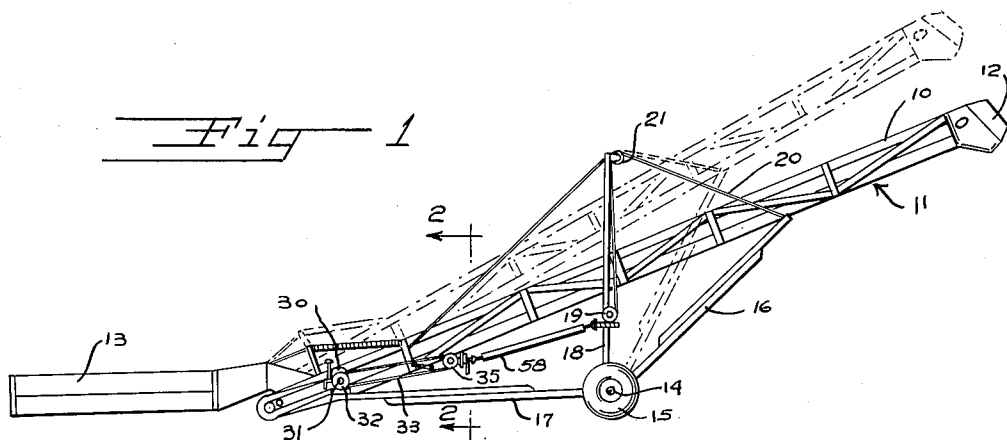
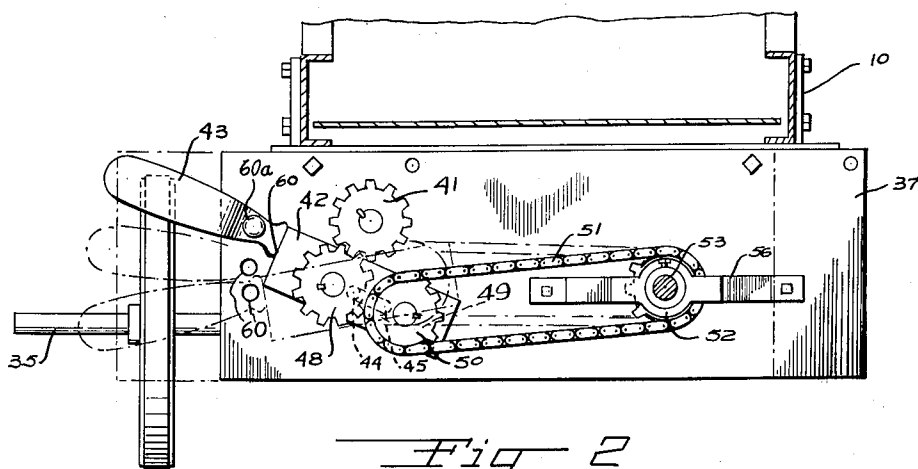
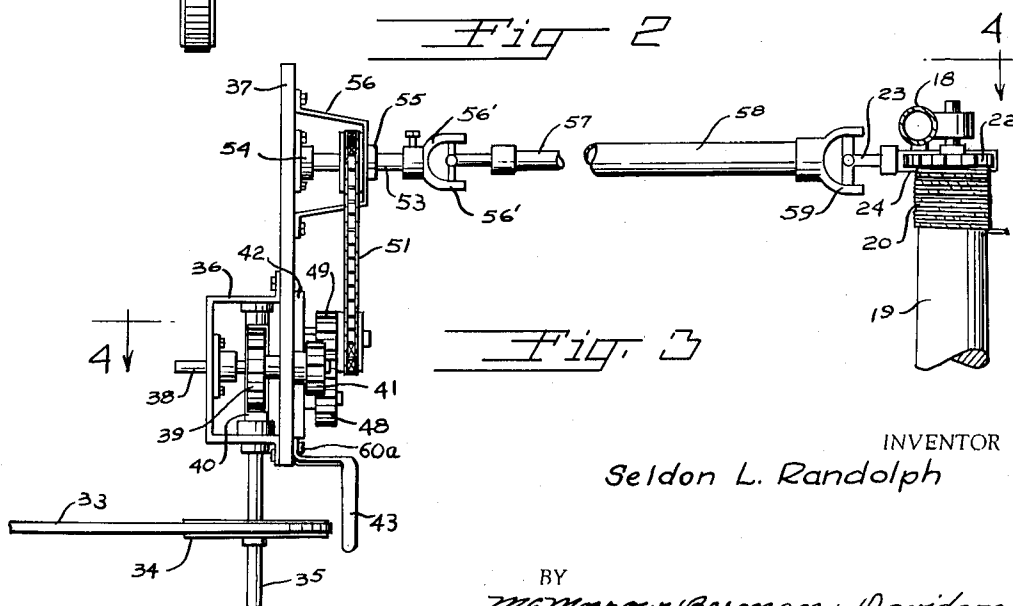
S. L. RANDOLPH

2,722,129

DRIVE MECHANISM FOR GRAIN LOADER

Filed Jan. 27, 1953

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INVENTOR

Seldon L. Randolph

BY

McMorrow, Gorman & Davidson
ATTORNEY

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DRIVE MECHANISM FOR GRAIN LOADER

Seldon L. Randolph, Loraine, Ill.

Application January 27, 1953, Serial No. 333,429

3 Claims. (Cl. 74—220)

This invention relates to grain loaders, and more particularly to an improved grain loader of the power operated type having means for reversing the mechanism that varies the elevation of the delivery end of a loader or conveyor.

The main object of the invention is to provide a novel and improved power operated grain loader which is simple in construction, which is easy to manipulate, and which is provided with simple and reliable means for reversing the mechanism that varies the elevation of the delivery end of the loader.

A further object of the invention is to provide an improved grain loader having means for reversing the mechanism that varies the elevation of the delivery end of the loader, said means involving inexpensive components, being rugged in construction, and being adaptable for connection either to an independent prime mover or to the power takeoff shaft on a tractor.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a side elevational view of a power driven grain loader constructed in accordance with the present invention, the loader being shown as driven by an independent prime mover, for example, a gasoline engine.

Figure 2 is an enlarged transverse vertical cross sectional view taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged top plan view of the structure shown in Figure 2, said view also showing in fragmentary view a portion of the cable reel and the power shaft for operating same.

Figure 4 is an enlarged cross sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a fragmentary side elevational view of the rear portion of a power driven loader according to the present invention, shown connected to the power takeoff shaft of a tractor.

Figure 6 is a top plan view of the structure shown in Figure 5.

Referring to the drawings, and more particularly to Figures 1 to 4, 11 generally designates the grain loader, the loader comprising an elongated belt conveyor unit 10 of conventional construction having on its delivery end a material directing and deflecting spout 12 and having its intake end connected to a box or hopper 13 into which the material, such as grain, may be deposited from a truck or wagon.

In one use of the device, the hopper 13 is disposed on the ground at a convenient location and the spout 12 is placed in the window of a granary or other storage structure, and grain is brought to the loader on trucks or wagons and deposited into the box or hopper 13, from which it is elevated by the belt conveyor unit 10 and delivered through the spout 12 into a bin or other storage compartment at the inner side of the window through which the spout extends. As the windows through which the grain is delivered into the storage structures are at different heights above the ground, it is necessary to provide means for raising and lowering the delivery end of the conveyor unit to accommodate the same to different window heights. Where the device is used for moving

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material from a storage area onto vehicles, it is necessary to raise the delivery end of the conveyor unit as the height of a load increases to keep the spout 12 properly spaced from the top of the load to avoid clogging or spilling of the material.

As the material must be used at various locations, it is made portable, and for this reason, an axle 14 is provided, said axle being disposed below the conveyor unit 10 intermediate the length of the latter, the axle 14 having the ground engaging wheels 15 mounted thereon. The conveyor unit 10 is supported on suitable struts extending from the axle to the conveyor unit. One pair of struts 16 is secured at corresponding ends to the axle 14 and has the opposite ends of the struts slidably engaging the under side of the conveyor unit 10 at a location between the delivery end of the conveyor unit and the midlength location of the latter. Another pair of struts 17 is secured at corresponding ends to the axle 14 and is pivotally secured at their opposite ends to the conveyor unit 10 near the intake end of the conveyor unit. A pair of masts 18 extend upwardly from the axle at respectively opposite sides of the conveyor unit and are normally substantially vertically disposed.

A cable drum 19 is journaled at its ends on the masts 18, for example, in the manner illustrated in my prior Patent No. 2,579,963, said cable drum being disposed substantially perpendicular to the masts. Cables 20 are wound, each at one end on the drum 19, and are carried over sheaves 21 mounted one at the upper end of each of the masts 18. At their other ends, these cables 20 are respectively connected to the struts 16 and the ends of the struts engaging the under surface of the conveyor unit 10.

A worm wheel 22 is mounted at one end of the cable drum 19, and a worm shaft 23 having a worm 24 thereon meshing with the worm wheel 22 is supported in suitable bearings carried by the masts 18 for rotating the cable drum.

When the cable drum 19 is rotated in one direction to wind in the cables 20, the struts 16 are pulled toward the masts 18 so that their upper ends slide along the lower surface of the conveyor unit away from the delivery end of the latter and thereby raise the delivery end of the conveyor unit. When the cable drum is rotated in the opposite direction, the cables are let out, permitting the struts 16 to move toward the delivery end of the conveyor unit, thereby lowering the delivery end of the unit.

As the conveyor unit is a heavy structure, manual rotation of the cable drum to raise and lower the delivery end of the unit is extremely laborious and time-consuming, and, when the height of the delivery end of the loader conveyor unit must be frequently adjusted, the present manual operation of the height adjusting means, heretofore accomplished by means of a hand crank secured to the worm shaft 23, materially reduces the efficiency of operation, decreases the capacity of the unit, and may even necessitate the employment of additional labor to operate the manual adjusting means.

In accordance with the present invention, the conveyor unit 10 is powered by suitable power means mounted near the loader. For example, a gasoline engine 30 may be mounted on the frame of the conveyor unit 10. The engine 30 is provided with an output shaft 31 having a pulley 32 which is coupled by means of a belt 33 to a pulley 34 secured on a transversely extending shaft 35. The shaft 35 is rotatably supported on a generally U-shaped bracket member 36 which, in turn, is secured to a transversely extending rectangular plate member 37 secured to and depending from the frame of the conveyor unit 10, in the manner illustrated in Figure 2. Designated at 38 is a driving shaft which is journaled in the plate 37 and the bight portion of the bracket member

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36, said shaft 38 having secured thereon the worm wheel 39. Meshing with the worm wheel 39 is a worm 40 provided on the shaft 35. Secured to the shaft 38 is the driving gear 41 which is arranged parallel to and adjacent the transverse plate 37.

Designated at 42 is a lever member which is pivotally and slidably connected to the plate member 37 for pivotal and sliding movement in a plane parallel to said plate member, as by a pin 44 secured to the intermediate portion of the lever member 42 and extending through a slot 45 formed in the plate 37. The lever 42 is provided with the offset operating handle 43 rigidly secured thereto.

Designated at 48 and 49 are respective gears journaled on the lever member 42 on opposite ends of the slot 45, the gears 48 and 49 being in mesh. Rigidly secured to the gear 49 concentric therewith is a sprocket wheel 50 which is coupled by a sprocket chain 51 to another sprocket wheel 52 carried on the driven shaft 53, said driven shaft being rotatably supported on a first bearing member 54 secured to plate 37 and in a second bearing member 55 secured to the bight portion of a U-shaped bracket member 56 which is in turn secured to plate 37. Shaft 53 is connected by a universal joint 56' to an inner telescopic shaft segment 57 which is slidably and non-rotatably received in an outer telescopic shaft segment 58. The end of shaft segment 58 is connected by a universal joint 59 to the worm shaft 23.

As shown in Figure 2, the lever 42 may be positioned with the gear 48 in mesh with the driving gear 41, whereupon torque is transmitted from the driving gear 41 through the gear 48 to the driven gear 49, whereby torque is finally transmitted through the sprocket wheels 50 and 52 and their chain 51 to the driven shaft 53. This torque is again transmitted through the universal joint 56', the shaft segments 57 and 58, and the universal joint 59 to the worm shaft 23, where in turn the torque is transmitted through the worm wheel 22 to the cable drum 19. To reverse the direction of rotation of the cable drum 19, the lever 42 may be moved to a position wherein the driving gear 41 meshes directly with the gear 49, the intermediate gear 48 being then disengaged from the driving gear 41. Thus, the operating handle 43 may be rotated from the position shown in full line view in Figure 2, to the lowermost dotted view position of said handle. In an intermediate position of the handle, shown in dotted view in Figure 2, the driving gear 41 is unmeshed from both of the gears 48 and 49.

The plate 37 may be provided with suitable apertures 60 to receive a detent pin 60a projecting from the operating handle 43 of the lever 42, to lock the lever in any one of the three positions described above, namely, the forward position, the reverse position, or the neutral intermediate position. For example, an ordinary bolt may be provided to secure the lever 42 of the operating handle 43 in any one of the three above-described positions, the bolt passing through the selected aperture 60 in the plate 37.

Referring now to the form of the invention illustrated in Figures 5 and 6, it will be seen that the shaft 38 may be connected through suitable coupling means to the power take-off shaft 61 of a tractor. Thus, a sprocket chain transmission unit 62 may be employed, said unit being pivotally mounted on a bracket 63 which is secured to the frame of the conveyor unit 10, the chain transmission unit 62 being swingable to a desired position relative to the bracket 63. The input shaft 64 of the chain transmission unit 62 may be connected to the power take-off shaft 61 by a transmission shaft 65 having the respective universal joints 66 and 67 at its opposite ends, as illustrated, the universal joint 66 being connected to the power takeoff shaft 61 and the universal joint 67 being connected to the chain transmission shaft 64. The output shaft 68 of the chain transmission unit may be connected through a universal joint 69, a transmission

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shaft 70 and a second universal joint 71 to an elongated transmission shaft 72 which is suitably journaled, as by a bearing 73 to the frame of the conveyor unit 10. The end of the transmission shaft 72 is connected by a universal joint 74 to the shaft 38.

As illustrated in dotted view in Figure 6, the chain transmission unit 62 may be swung to a laterally projecting position and may be connected to the output shaft of a suitable prime mover, such as a gasoline engine or the like, if so desired.

As in the previously described form of the invention, the modification shown in Figures 5 and 6 is provided with the reversing means including the reversing lever 42 having the operating handle 43 which is employed to reverse the direction of rotation of the cable drum 19, if so desired, as described in connection with the first form of the invention disclosed above.

While certain specific embodiments of an improved grain loader have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A reversing drive mechanism for a grain loader comprising a driven shaft, a first sprocket wheel carried by said driven shaft, a driving shaft, a fixed plate member rotatably supporting said driving shaft, a driving gear secured on said driving shaft, a lever slidably and pivotally secured to said plate member, a pair of meshing gears journaled on said lever and being selectively meshingly engageable with said driving gear, a second sprocket wheel secured to one of said meshing gears, and a sprocket chain engaged on the sprocket wheels, whereby the driven shaft may be selectively connected to the driving shaft for forward or reverse rotation of the driven shaft by pivotal and sliding movement of said lever.

2. A reversing drive mechanism for a grain loader comprising a worm, a driven shaft connected to said worm, a first sprocket wheel carried by said driven shaft, a driving shaft, a fixed plate member rotatively supporting said driving shaft, a driving gear secured on said driving shaft, a lever slidably and pivotally secured to said plate member, a pair of meshing gears journaled on said lever and being selectively meshingly engageable with said driving gear, a second sprocket wheel secured to one of said meshing gears, and a sprocket chain engaged on the sprocket wheels, whereby the driven shaft may be selectively connected to the driving shaft for forward or reverse rotation of the worm by pivotal and sliding movement of said lever.

3. A reversing drive mechanism for a grain loader comprising a worm, a driven shaft connected to said worm, a first sprocket wheel carried by said driven shaft, a driving shaft, a fixed plate member rotatively supporting said driven shaft, a driving gear secured on said driving shaft, a lever arranged parallel to said plate member, pin and slot means pivotally and slidably connecting said lever to said plate member, a pair of meshing gears journaled on said lever and being selectively meshingly engageable with said driving gear, a second sprocket wheel secured to one of said meshing gears, and a sprocket chain engaged on the sprocket wheels, whereby the driven shaft may be selectively connected to the driving shaft for forward or reverse rotation of the worm by pivotal and sliding movement of said lever.

References Cited in the file of this patent

UNITED STATES PATENTS

517,303	Robinson, Jr.	Mar. 27, 1894
2,529,035	Loewe et al.	Nov. 7, 1950
2,579,963	Randolph	Dec. 25, 1951