Dec. 16, 1930. E. HARTMAN 1,784,872

PORTABLE GRAIN ELEVATOR

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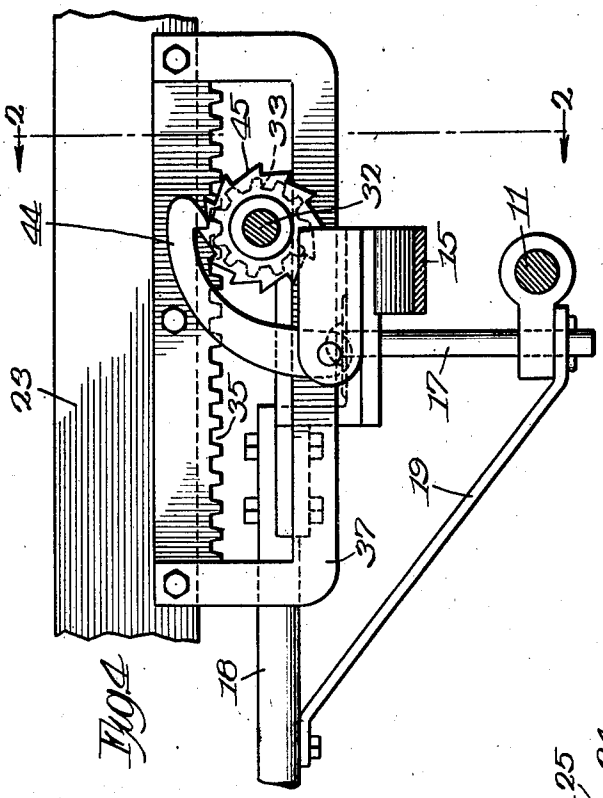


Fig 4

Fig. 1

Inventor:
Edward Hartman
By Gillson, Mann & Cox Attys.

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Fig. 3

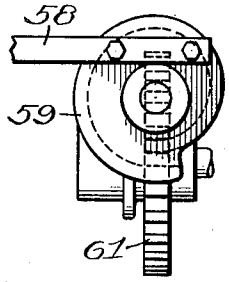


Fig. 2

Inventor
Edward Hartman
By Gillson, Mann & Coy
Attys

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UNITED STATES PATENT OFFICE

EDWARD HARTMAN, OF SANDWICH, ILLINOIS, ASSIGNOR TO SANDWICH MANUFACTURING CO., A CORPORATION OF ILLINOIS

PORTABLE GRAIN ELEVATOR

Application filed August 21, 1926. Serial No. 130,759.

This invention relates to elevators for grain and the like and more particularly to portable grain elevators.

The principal object of the invention is the provision of new and improved means for adjustably mounting an elevator mechanism on its supporting truck.

Another object of the invention is the provision of an elevator with new and improved adjusting mechanism for the same that is cheap to manufacture, easily assembled, readily adjusted, rugged in construction, that is not likely to become broken or get out of order.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawings in which—

Fig. 1 is a perspective view of a portable grain elevator showing the invention in position thereon;

Fig. 2 is a vertical section of the elevator substantially on the line 2—2 of Fig. 4;

Fig. 3 is a detail view showing the snail gear for elevating the elevator; and

Fig. 4 is a section on the line 4—4 of Fig. 2.

Referring now to the drawings in which the same reference characters are employed to indicate the same parts throughout the drawings, the numeral 10 designates a truck having the front axle 11, the rear axle 12, wheels 13 therefor and the connecting members or frame 14. The frame 14 is adapted to be adjusted in length to accommodate elevators of various lengths as is usual in such constructions. The front axle 11 is provided with a riser member 15, see Fig. 2, rigidly connected thereto. An elevator support or bolster 16 is mounted on said riser and is pivoted to said riser and axle as by the king bolt 17. The coupling pole 18 of the frame 14 is rigidly connected to said support 16. A brace 19 rigidly connected to said coupling pole extends beneath said axle and is pivotally mounted on said king pin 17.

An elevator 21 is pivotally and slidably mounted on said support 16. The elevator 21 comprises a trunk member 22 and a return or pan member 23 in which operates the conveyor comprising the endless chains 24 carrying the drag plates 25 for elevating the grain delivered into, what for the convenience of description will be termed the front end of said elevator, by the hopper 26 as is usual in such constructions. Since the details of the elevator and hopper mechanism constitute no part of the present invention, it is not thought necessary to further describe the same except to state they are both operated from the power shaft 27 from a suitable source of power as an engine or horse power device. The power shaft 27 is provided with the conventional universal or knuckle joints 28. The extension 29 of the power shaft 27 is adapted to operate a wagon dump mechanism not shown for elevating the front end of a wagon for dumping the grain contained therein into the hopper 26 from which it is discharged into said elevator.

It is necessary to raise and lower the rear end of the elevator to accommodate bins or cribs having openings or doorways at various heights from the ground. In order that the device be sufficiently stable to be properly operated, it is necessary that the lower or front end of the elevator be in contact with the ground or floor. But in order that this may be done, it is necessary that the elevator be longitudinally adjustable along its support. If, for instance, the rear or upper end of the elevator 21 be lowered from the position shown in Fig. 1, the front, lower, or boot end 31, thereof, will be raised above the ground or floor, unless the whole elevator be slid forwardly.

The means for moving the elevator forwardly will now be described. A shaft 32 is rotatably mounted in the support 16 directly above the axle 11 and is provided with the pinions 33 and 34 which are in engagement with racks 35 and 36 rigidly secured to the under side of said elevator 21. Keepers 37 and 38 prevent disengagement of said racks and pinions and also prevent lateral movement of said elevator.

Suitable means are provided for rotating the shaft 32. As shown, a hand lever 39 is pivotally mounted on the shaft 32. The lever 39 is provided with a keeper 41 in which is slidably mounted a spring-pressed latch mem-

ber 42 which is adapted to engage the teeth of a ratchet wheel 43 for holding the lever fixed to said wheel for turning said shaft. The latch is operated in the usual manner by pivoted member 46. A pawl and ratchet 44 and 45, respectively, are adapted to hold the shaft 32 in adjusted position.

The pivoted lever 39 may be adjusted to the most advantageous position about the ratchet wheel 43 for rotating the shaft 32 in either direction. The lever 39 being mounted above the axle 11, it is accessible from either front or the rear of said axle. This is considered an important feature of the invention because of the accessibility of said lever. Furthermore, by mounting the lever and the shaft 32 adjacent to the forward portion of the elevator, there will be a minimum amount of raising and lowering of the front end of the elevator when the rear end is raised or lowered.

Suitable means are provided for raising and lowering the rear end of the elevator. As shown, this means comprises a pair of derrick members or supports 47 and 48 pivoted at their lower ends to the truck and connected at their upper ends by the cross member 49. A pair of cables 51 and 52 secured to the cross member 49 and to the lower end of the elevator will limit the rearward swinging movement of the supports 47 and 48.

The rear or upper end of the elevator 21 is provided with a bail 53 which is pivoted thereto. An elevating cable 54 having its upper end connected to a pulley 55 secured to the bail 53 extends over a pulley 56 mounted on the cross member 49 and beneath said pulley 55 and has its lower end wound on a drum 57. The drum 57 is adapted to be rotated by a crank 58 and gear members 59 and 61 to wind and unwind the cable for raising and lowering the elevator. The gear member 59 is in the form of a spiral which is adapted to engage the teeth on the gear 61 as indicated in Fig. 3. By means of this gear which for convenience will be termed a snail gear, the elevator will be held in any adjusted position of the crank 58.

When it is desired to lower the elevator from the position shown in Fig. 1, the crank 58 is rotated to unwind the cable 54 and when the elevator has been lowered a sufficient distance, the elevator is slid longitudinally downward by manipulating the lever 39 and the pawl 44 until the lower end of the elevator comes in contact with the ground or the floor.

When it is desired to move the device from one place to another, the elevator 21 is lowered onto the supports 62 and 63 carried by the rear axles. In the meantime the elevator may have been moved forwardly by the lever 39 if desired. The supporting members or standards 47 and 48 are then lowered forwardly; the hopper 26 is swung upwardly and downwardly onto the elevator and the power shaft is disconnected at joints 28. Any suitable power means may then be attached to the truck for moving the same to the desired position.

The trunk and pan members of the elevator may be of any material suitable. Preferably they are formed from sheet metal and have their upper edges bent lateraly at right angles and then downwardly to form reinforcing channels 64 and 65, respectively. The racks 35 and 36 are preferably L-shape in cross section and are secured to the sides and bottom of the pan member.

It is thought from the foregoing taken in connection with the accompanying drawings that the construction and operation of my device will be apparent to those skilled in the art, and that various changes in size, shape, proportion and details of construction may be made without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. In combination, a truck comprising front and rear axle assemblies, a bolster member, a coupling member secured to said rear axle assembly, means for pivotally connecting the forward end of said coupling member to said front axle assembly, means for pivotally mounting said bolster member on said front axle assembly, a shaft journaled in said bolster, a pair of pinions on said shaft, an elevator, a rack bar secured to each side of said elevator adjacent to the front end thereof for engaging said pinions for slidably adjusting said elevator longitudinally, keepers for holding said pinions in engagement with the rack, a lever pivoted to said shaft, a toothed wheel for rotating the same, a pawl and ratchet for holding said shaft in adjusted position, and means for raising and lowering the rear end of said elevator.

2. In combination, a truck comprising front and rear axle assemblies, a coupling member secured to said rear axle assembly, means for pivotally connecting the forward end of said member to said front axle assembly, a bolster member movably mounted on said front axle assembly, a shaft journaled in said bolster member, an elevator, means for slidably and pivotally mounting the forward portion of said elevator on said shaft, means for adjusting said elevator along said shaft, a pair of supports carried by said rear axle assembly and movable to upright position, hoisting means connected to said supports and elevator, and non-reversible winding means cooperating with said hoisting means and mounted on the forward portion of said elevator for raising and lowering the rear end of said elevator.

In testimony whereof I affix my signature.

EDWARD HARTMAN.