June 25, 1929. A. E. GILMAN 1,718,227

PORTABLE ELEVATOR

Filed Oct. 22, 1925 2 Sheets-Sheet 1

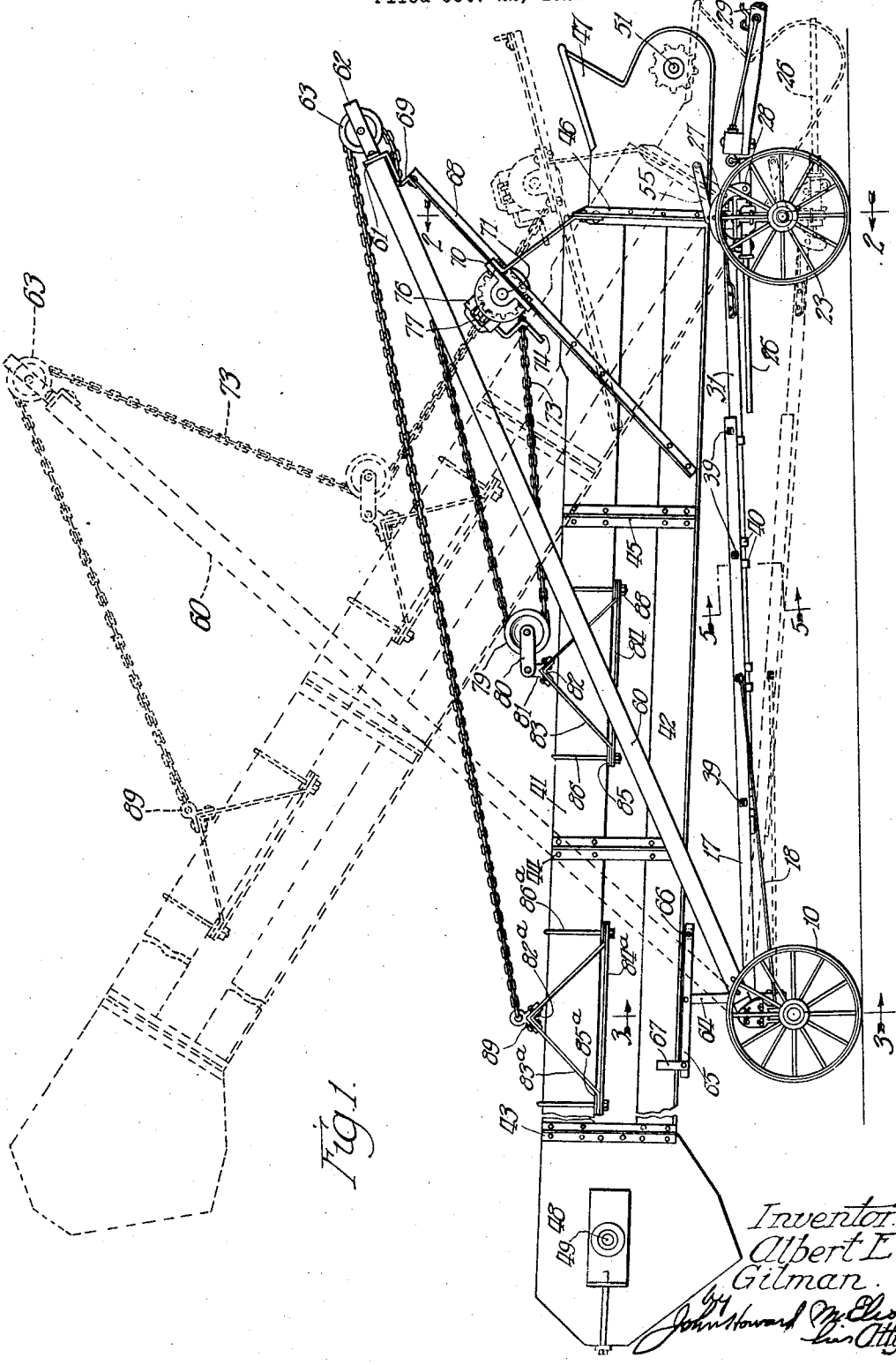


Fig. 1.

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Fig. 1.

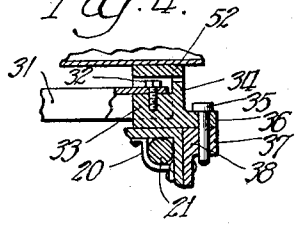


Fig. 2.

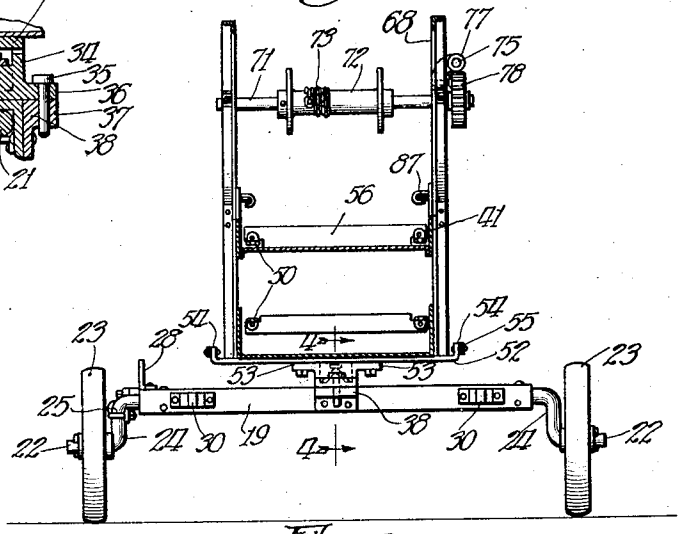


Fig. 3.

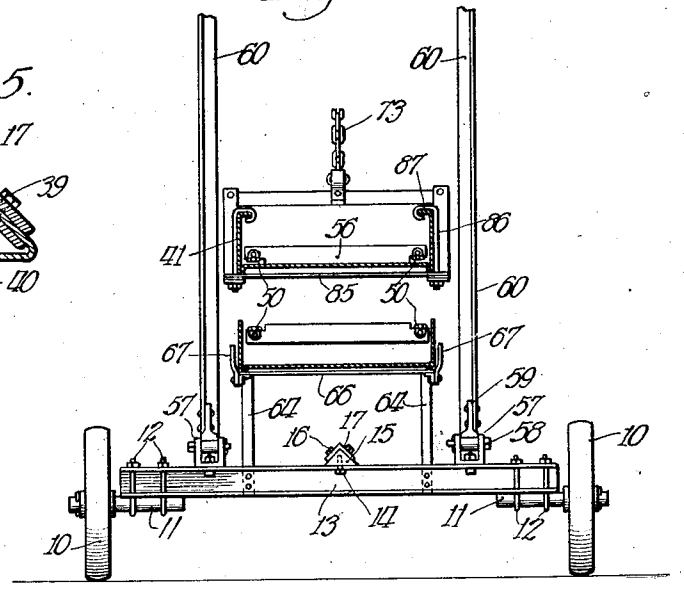
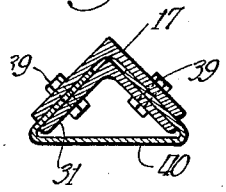


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT E. GILMAN, OF OTTAWA, ILLINOIS, ASSIGNOR TO KING AND HAMILTON COMPANY, OF OTTAWA, ILLINOIS, A CORPORATION OF ILLINOIS.

PORTABLE ELEVATOR.

Application filed October 22, 1925. Serial No. 64,119.

My invention is concerned with portable elevators of the type in which the elevator trough, mounted upon running gears, is adapted to be lowered to a horizontal position for transportation, and to be elevated to any desired practicable angle to deliver the material to be elevated wherever it may be desired, and is concerned primarily with the mounting whereby the raising and lowering of the trough can be effected. To this end it consists of a novel combination of elements, all as will be specifically described and the novelty particularly pointed out in the claims.

To illustrate my invention, I annex hereto two sheets of drawings in which the same reference characters are used to designate identical parts in all the figures, of which,—

Fig. 1 is a side elevation of a portable elevator embodying my invention showing the elevator in its horizontal position ready for transportation in full lines, and in an elevated position in dotted lines;

Figs. 2 and 3 are vertical sections on the lines 2—2 and 3—3 of Fig. 1;

Fig. 4 is a detail in section on an enlarged scale on the line 4—4 of Fig. 2; and

Fig. 5 is a detail on a larger scale in section on the line 5—5 of Fig. 1.

In carrying out my invention, I provide running gears which are preferably constructed substantially as follows: The rear wheels 10 are mounted on the axles 11 secured by the U-bolts 12 to the ends of the axle bar 13, which is preferably constructed of an I-beam and has secured on the top of the center thereof by the screws 14 the block 15, triangular in cross-section, as shown in Fig. 3, to which is secured by the screw bolts 16 the end of the angle iron 17 constituting one-half of the reach. This structure is braced by the rods 18 secured at their forward ends to the angle iron 17, and having their rear ends secured toward the ends of the axle bar 13.

As best shown in Figs. 1, 2 and 4, the front axle bar is constructed of the angle iron 19 in which is rotatably secured by the bearing pieces 20 the eccentric portion 21 of a rod, the ends 22 of which serve as axles for the front wheels 23. The ends 22 of the rod are connected with the eccentric central portion by the vertical portions or offsets 24, and secured to one of these offset portions 24 by the clamping member 25 is a lever 26, seen in Fig. 1, which carries a locking pin, not shown, adapted to cooperate with one of the recesses 27 in the segment 28 secured to the adjacent end of the angle iron 19, so that by shifting the position of the lever 26 from the full line position shown in Fig. 1 in which the end of the elevator is held up from the ground, to the position shown in dotted lines, the boot end may be lowered to the ground, this feature of construction being found in the Koontz Patent, No. 936,641, granted October 12, 1909, to which reference is made for further details of this adjustment. The tongue 29 is secured in the customary manner between the eyes 30 secured on the front of the axle bar 19.

The front portion 31 of the adjustable reach is formed of angle iron of the same section as the cooperating rear angle iron 17, and, as seen in Fig. 4, is secured by the screw bolt 32 to the angular lug 33 forming a part of the casting 34 which is swiveled on the top of the front axle bar 19 by the king-pin 35 passed through an aperture formed in the lug 36 of the casting and into the cooperating aperture in the lug 37 forming part of the casting 38 bolted to the front of the axle bar 19. The overlapping portions of the angle irons 17 and 31 are provided with a plurality of equi-distant apertures through which the bolts 39 may be passed to secure the two sections of the reach together in any desired relationship to lengthen or shorten the reach. As the inner angle of these angle irons is formed with a fillet which prevents the exterior angle fitting snugly into the interior angle, I place between these bars, preferably adjacent the bolts 39, the thin metallic strips 40, seen in Fig. 5, which are open at one angle and substantially surround the angle iron 31 over which they are slipped when the reach is assembled. By employing these members 40, the two sections 17 and 31 of the reach can be secured firmly together at any desired adjustment by the use of the bolts 39.

The elevator consists primarily of two sheet metal troughs 41 and 42, which are of any well known and desired construction, which are connected at intervals by the

transverse members 43, 44, 45 and 46 bolted thereto near the ends and at intermediate positions so as to form a substantially rigid structure. The end of the elevator over the front wheels 23 is formed with the customary boot 47 into which the material to be elevated is discharged, while the other end has secured thereto the customary discharge head 48 in which is journaled the customary shaft 49 for the customary sprocket wheels which carry the conveyor chains 50, seen in Figs. 2 and 3. The other shaft 51 for the sprocket wheels is journaled in the boot and carries the customary sprocket wheels (not shown), for the chains 50, there being nothing novel in the construction of the elevator troughs as so far described. The boot end of the elevator trough rests on the cross-piece 52, best seen in Fig. 2, which is bolted to the arms 53 of the casting 33. The upturned ends 54 of the cross-piece 52 are connected by the links 55, seen in Fig. 1, with the sides of the boot, and when the elevator is to be used the tongue 29 is detached, and by shifting the lever 26 from the full line position of Fig. 1 to the dotted line position, the boot can be lowered to the position shown in dotted lines. The elevator chains 50 are connected by the customary flights 56 which cooperate with the trough 41 to elevate the material therein in the customary manner.

The rear axle 13 has bolted thereto the pair of U-shaped castings 57, best seen in Fig. 3, in which are fulcrumed by the bolts 58 the eye castings 59 which are bolted to the angle irons 60 forming the sides of the derrick frame which embraces the elevator trough, as seen in Figs. 1 and 3. The other ends of the angle irons 60 are connected by the cross-piece 61, preferably composed of angle iron, and having the generally U-shaped bearing bracket 62 for the sheave 63 journaled therein bolted to the central portion thereof. The rear axle 13 has bolted thereto the pair of standards 64, seen in Figs. 1 and 3, which have bolted to their upper ends the longitudinal pieces 65, which with the standard 64 form a pair of T-shaped frames which are connected at each end by the transverse pieces 66, seen in Fig. 3, and indicated by dotted lines in Fig. 1, the same bolts at one end serving to secure the upright pieces 67 which form guides to catch the trough and center it if it should be slightly out of alinement when it is lowered into the horizontal position shown in full lines in Fig. 1 for the purposes of transportation, the trough being supported directly by the two cross-pieces 66.

Secured to the sides of the trough sections 41 and 42 are the angle irons 68, seen in Figs. 1 and 2, which are connected at their upper ends by the angle iron 69 upon which the upper end of the derrick frame rests when it is lowered and ready for transportation. These angle irons 68 each have secured to the upper sides thereof the opposed bearing brackets 70 in which is journaled the shaft 71 carrying the winding drum 72 upon which is wound the chain 73, preferably by the crank handle 74 of a shaft 75 journaled in the bracket 76 forming a part of one of the bearing castings 70 and having the worm 77 secured thereon and meshing with the worm wheel 78 secured on the adjacent end of the shaft 71. The chain 73 extends from the drum 72 over the sheave 79 journaled in the yoke 80 which is pivoted on the lug 81 bolted to the center of the angle iron cross-piece 82, which is bolted at its ends to the angular piece 83 which has its ends turned parallel to the length of the trough 41. Immediately beneath the ends of this angular piece 83 are the ends of the flat side piece 84, and above the ends are the ends of the transverse pieces 85, 85, best seen in Fig. 3, and the pieces on each side are securely clamped to the trough by the hook bolts 86 which, as best seen in Fig. 3, have their hooked upper ends caught over the horizontal flanges 87 formed on the upper sides of the trough 41, the lower ends of the bolts 86 being threaded and provided with the nuts 88 by which the frame is thus securely bolted in any desired position of adjustment along the trough. The chain 73 passes from the sheave 79 over the sheaves 63, and back down to the eye casting 89 secured to the cross-piece 82^a of a frame similar in every respect to the frame carrying the casting 81, and which is designated by similar reference numerals carrying the added reference character "a".

The operation of the complete apparatus will now be readily apparent. The elevator when ready for transportation is in the position shown in full lines in Fig. 1, in which the tongue 29 can be attached in the manner customary in these devices, and a team secured thereto to haul it to whatever location is desired. When properly positioned there, the tongue is removed and the lever 26 operated to lower the axle 29 to bring the boot 47 down to the ground. The crank handle 74 is then turned, winding up the chain on the drum 72, and this winding up of the chain necessarily results, through the gearing shown, in the simultaneous elevation of the derrick frame and the elevator trough to any desired angle and height within the limit of the apparatus, and due to the employment of the screw gearing shown, the elevator trough and the derrick frame will remain in any desired adjustment without the use of any braces or stays. If it is desirable to apply a longer elevator trough, the bolts 39 can be removed and the reach lengthened, as described in the specification, in which case the location of the supporting brackets for the end of the chain and the sheave 79 will be similarly spaced to produce the prop-

er balance and relative location of the parts. When the job has been completed, the handle 74 is rotated in the reverse direction, and the trough it readily lowered until it rests on the transverse pieces 66.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modification, and that I do not desire to be limited to any interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new and desire to secure by Letters Patent of the United States, is—

1. In an elevator, the combination with running gears, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame, a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end.

2. In an elevator, the combination with running gears, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame, a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end where it is wound on a drum supported from the trough.

3. In an elevator, the combination with running gears, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame, a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end where it is wound on a drum supported from the trough, and provided with a worm wheel and a worm gear and handle.

4. In an elevator, the combination with running gears, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame, a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end where it is wound on a drum, and provided with a worm wheel and a worm gear and handle, said drum, worm wheel and worm gear being carried by a rigid frame attached to the sides of the trough and extending above the same and serving to support the free end of the derrick frame when the trough is lowered.

5. In an elevator, the combination with running gears having a reach the length of which can be adjusted, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said chain and pulley gearing including a pulley supported from a frame secured on the trough and adjustable lengthwise thereof to vary the distance from the fulcrum at which the power is applied by the pulley to lift the trough as the reach is lengthened or shortened, said frame consisting of a pair of triangular side pieces connected by a cross-piece over the top of the trough and secured thereto by a pair of hooks embracing the tops of the sides of the trough.

6. In an elevator, the combination with running gears, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame, a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end, said trough pulley and the fixed end of the chain each being supported from a frame adjustably secured lengthwise of the trough.

7. In an elevator, the combination with running gears having a reach the length of which can be adjusted, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame,

a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end, said trough pulley and the fixed end of the chain each being supported from a frame adjustably secured lengthwise of the trough.

8. In an elevator, the combination with running gears having a reach the length of which can be adjusted, of an elevating trough fulcrumed on one end thereof, a derrick frame embracing the trough fulcrumed at the other end, and chain and pulley gearing connecting the trough and derrick frame whereby they can be tilted on their fulcra to elevate the delivery end of the trough, said gearing consisting of a pulley on the trough, another pulley on the derrick frame, a chain attached at one end to the trough above the trough pulley and extending over the derrick frame pulley, and thence beneath the trough pulley to the other end, the place of attachment of the chain to the trough and the location of the trough pulley being adjustable to vary their relative position as the reach is lengthened or shortened.

9. In a portable elevator, the combination with running gears, of an elevating trough fulcrumed at one end thereof, gearing for raising and lowering the trough, and means for attaching said gearing to the trough consisting of side pieces beneath the edges of the trough, angular pieces above the side pieces and having their apexes extending above the top of the trough, transverse pieces at the ends of the side pieces and above the ends of the angular portions, and hook bolts caught over the tops of the sides of the elevator and having their other ends passed through and secured to the ends of the side pieces, the angular pieces and the transverse pieces substantially as and for the purpose described.

10. In a portable elevator, the combination with running gears, of an elevating trough fulcrumed at one end thereof, gearing for raising and lowering the trough, and means for attaching said gearing to the trough consisting of side pieces beneath the edges of the trough, angular pieces above the side pieces and having their apexes extending above the top of the trough, transverse pieces at the ends of the side pieces and above the ends of the angular portions, hook bolts caught over the tops of the sides of the elevator and having their other ends passed through and secured to the ends of the side pieces, the angular pieces and the transverse pieces substantially as and for the purpose described, and transverse pieces connecting the apexes of the side pieces.

11. In an elevator, the combination with running gears having means for adjusting the length of the reach to regulate the distance between the ends thereof, of an elevator trough fulcrumed at one end thereof, a derrick frame embracing the trough fulcrumed at the other end thereof, a suspension member adjustable on the trough so that it can be rigidly secured thereto at any desired distance from the elevated end thereof, and chain and pulley gearing connecting the trough and derrick frame and operating through said suspension member to elevate or lower the free ends of the trough and the derrick frame, the suspension member being adjustable on the trough in correspondence with the adjustment of the length of the reach so that the center of gravity of the complete structure will always fall well within the wheel base while permitting the elevator trough to be raised to the desired angle.

12. In an elevator, the combination with running gears having means for adjusting the length of the reach to regulate the distance between the ends thereof, of an elevating trough fulcrumed at one end thereof, a derrick frame embracing the trough fulcrumed at the other end thereof, a pair of suspension members each separately adjustable on the trough so that they can be rigidly secured thereto at any desired distances from the elevated end thereof, and chain and pulley gearing connecting the trough and derrick frame and operating through said suspension members to elevate or lower the free ends of the trough and derrick frame, the suspension members being adjustable on the trough in correspondence with the adjustment of the length of the reach so that the center of gravity of the complete structure will always fall well within the wheel base, while permitting the elevator trough to be raised to the desired angle.

In witness whereof, I have hereunto set my hand this 17th day of October, 1925.

ALBERT E. GILMAN.