April 17, 1934. O. B. JONES 1,955,238

PORTABLE BUCKET ELEVATOR

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Fig. 1

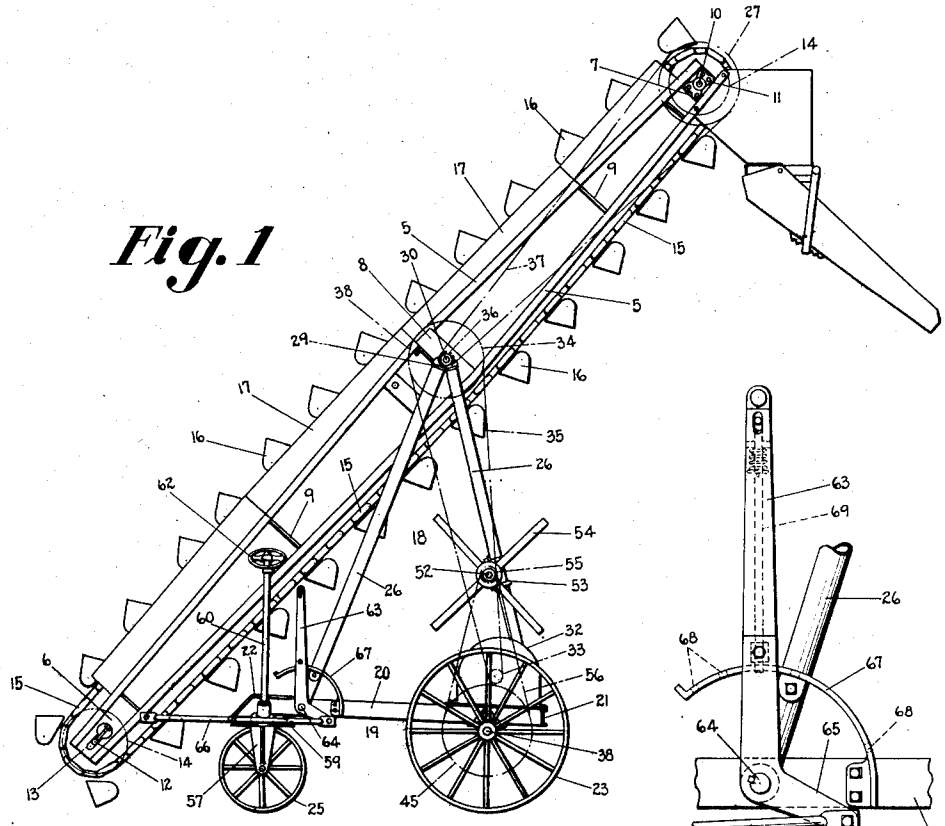


Fig. 5

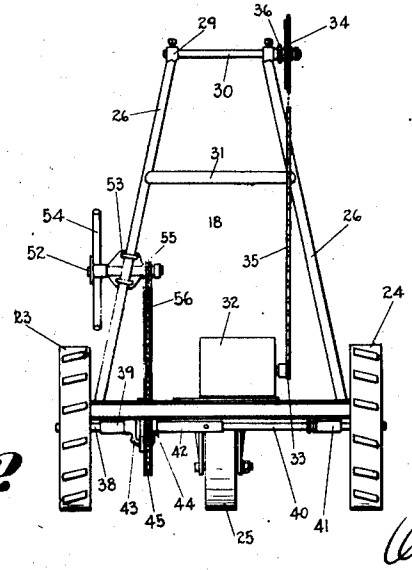


Fig. 2

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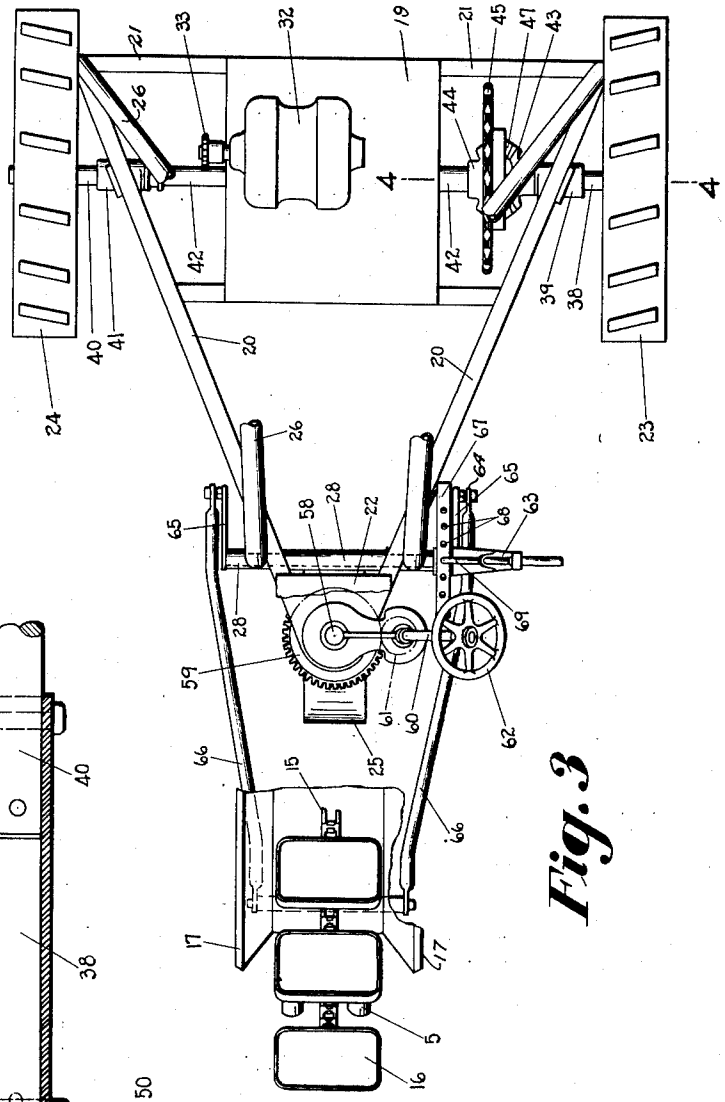


Fig. 3

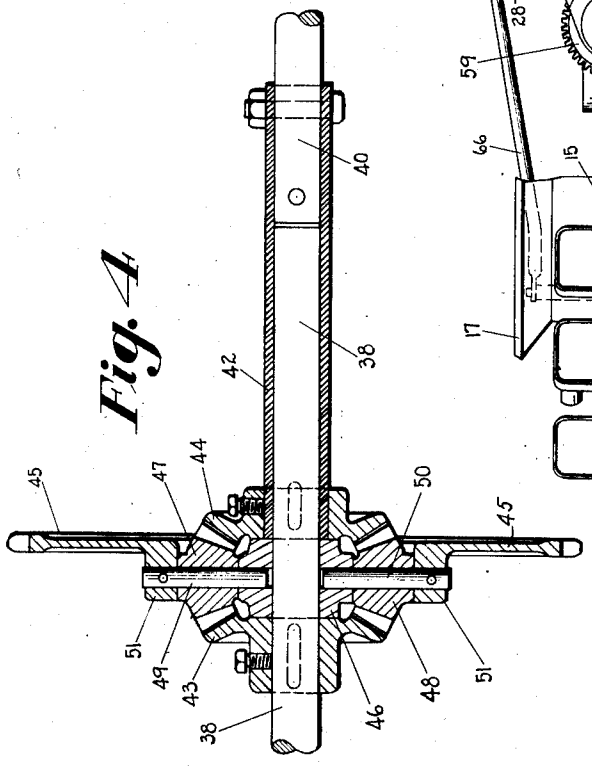


Fig. 4

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UNITED STATES PATENT OFFICE

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PORTABLE BUCKET ELEVATOR

Oscar B. Jones, Columbus, Ohio, assignor to The Jeffrey Manufacturing Company, Columbus, Ohio, a corporation of Ohio

Application November 1, 1929, Serial No. 404,125

1 Claim. (Cl. 198—233)

This invention relates to portable bucket elevators.

The object of the invention is to provide a light portable bucket elevator which can be easily moved when desired, and the control of which, either in operation or in moving, may be readily accomplished.

Another object of the invention is to provide a portable bucket elevator which is of light construction, low in cost of manufacture and upkeep, and efficient in operation.

With these and other objects and advantages in mind, attention is called to the drawings, in which:—

Figure 1 is a side elevation of the entire machine,

Figure 2 is an end elevation of the truck and elevator supporting frame,

Figure 3 is an enlarged plan view of the machine with the elevator broken away to reveal the truck mechanism,

Figure 4 is a sectional view along the line 4—4, of Figure 3, and

Figure 5 is a detail of the elevator control mechanism.

Referring specifically to the drawings, in which like numerals indicate like parts, the elevator frame comprises longitudinally extending pipes or bars 5 which converge at their opposite ends and are fastened together at the front end by the plate 6 and at the rear end by plate 7, and at the center by the plate and angle bar 8 and, at intervals along the frame, by angle bars 9. The head shaft 10 and the foot shaft 12 are set in bearings 11 and 13, one of which, preferably the foot bearing 13, is a take-up bearing, and are provided with sprocket wheels 14, around which passes the endless elevator chain 15, to which are attached the elevator buckets 16. The bearings 11 and 13 are mounted, as shown in Fig. 1, in the plates 6 and 7, which tie the converging ends of the frame bars 5 together. A drip pan or trough 17 is fixed to the elevator frame by welding or in any other suitable manner. It will be noted that the endless chain and buckets traverse this trough and in so doing, any material spilled from the buckets will be caught by the trough and carried back to the end of the elevator frame to again be taken up by the buckets.

The truck frame 19 comprises channel bars 20 which, as here shown, are connected at their rear ends by the cross channel bar 21 and converge forwardly. At their front ends they are connected by the plate 22. Traction wheels 23 and 24 are mounted at the rear end of the frame 19, the former being fixed to the shaft 38, which is mounted in bearing 39, and the latter being fixed to shaft 40, which is mounted in bearing 41. The shaft 40 is provided at one end with a sleeve 42 in which the shaft 38 is freely rotatable. At the front of the frame 19 will be mounted a castor wheel 25 so as to give a three-point support. The castor wheel 25 may be controlled in any suitable manner for steering, it being here shown as carried by a suitable fork 57 provided with the shaft 58, on which is mounted a gear 59. The castor wheel will be actuated by means of a steering shaft 60 provided with a suitable hand wheel 62 and a bevelled pinion 61 engaging the gear 59, so as to manipulate the castor and direct the movements of the machine. The castor wheel shaft 58 and the steering mechanism are carried in suitable bearing members and supports mounted on the apex plate 22 which ties the ends of the truck frame bars 20 together. It will be observed, as shown in Figs. 1 and 3, that the steering shaft 60 is inclined outwardly from the truck frame, so that it may be within easy and convenient reach of an operator standing on the ground for directing the travel of the machine.

In order to provide for a swinging movement in a vertical plane, the elevator frame is pivotally mounted on a vertically disposed supporting frame 18, of substantially triangular shape in side elevation, as shown in Fig. 1, which is rigidly connected to the truck frame 19. The supporting frame 18 is made up of pipes or bars 26 which are connected to the cross channel bar 21 of the truck frame 19 at the rear, and to the cross pipe or bar 28 at the opposite or front end of frame 19. The bar or pipe 28, secured to the narrowed end of the truck frame, gives an extended support for the forward bars or legs 26 of the frame 18 so that a stable base is provided for frame 18. The uprights of the frame 18 are connected at their upper ends by cap pieces 29, which are provided with bearings to receive the shaft 30, which shaft 30 and the pipe or bar 31 serve to brace the frame 18 laterally. The elevator frame 5 is pivotally mounted on the shaft 30, the pivot bearings for the conveyor through which the stationary supporting shaft 30 pass being carried by the spreader plates 8 which are secured centrally of the spaced rods 5 of the conveyor frame. It will be seen from Fig. 2, that the bars 26 are inclined inwardly from the points where they are attached to the truck frame to their tops where they are connected by the cap pieces 29, so that the supporting frame 18 described is of substantially pyramidal shape, and that its supporting

top, due to the position of the pyramidal frame bars 26, is substantially in the same vertical plane as the axis of the traction wheels 23 and 24, so that the load will be carried by the traction wheels and the single steering wheel relieved of the burying pressure of the load.

Mounted for free rotation at one end of the shaft 30, is a sprocket wheel 34 connected by chain 35 to the sprocket wheel 33 fixed to the armature shaft of an electric motor 32. It is obvious that other forms of motive power may be used instead of the electric motor, which is for illustrative purposes only. Fixed to the hub of sprocket wheel 34, is a sprocket wheel 36 of relatively small diameter, by means of which, through chain 37 and sprocket wheel 27 on the head shaft 10, the endless elevator chain 15 is driven.

To transport the machine the mechanism shown in detail in Figure 4 is utilized. It comprises the bevel gear 43 keyed to the shaft 38 and the bevel gear 44 keyed to the sleeve 42; a sprocket wheel 45 having a hub 46 which is positioned between the bevel gears 43 and 44 is freely rotatable on the shaft 38; and bevel pinions 47 and 48 are rotatably mounted on the shafts 49 and 50, respectively, the latter being positioned in aligned apertures of the hub 46 and bosses 51 of the sprocket wheel 45, and meshing with the bevel gears 43 and 44. To actuate this transporting mechanism, a shaft 52, mounted in a bearing 53 of the supporting frame 18, is provided, a hand wheel 54 and a sprocket wheel 55 being mounted on said shaft 52, a chain 56 connecting sprocket 55 with sprocket wheel 45. Upon rotation of the hand wheel, sprockets, and chain, the wheels 23 and 24 will be driven through the differential mechanism above described. The hand-wheel 54 is on the same side of the machine as the steering mechanism hereinbefore described, so that it will be readily accessible from the ground and may be manipulated by an operator simultaneously with, and from the same position relative to the machine, as the steering mechanism. It will be observed that it is so located that an operator, standing at the side of the machine, takes his position between it and the steering and adjusting mechanisms. Furthermore, it is disposed substantially directly over the traction shaft so that little, if any, loss of power occurs in transmission. It will also be observed (see Fig. 2) that the entire mechanism, including the hand-wheel, lies within the overall width of the machine so that there are no projecting parts to foul objects past which the machine may be moved.

In order to guard against injury to the elevator frame and buckets from striking the ground when moving the machine from place to place, there is provided a lever 63, which is pivoted to the truck frame at 64, and has an arm 65 attached thereto and extending to the rear of the pivot to form a bell-crank lever. A connecting rod 66 is pivotally connected to the arm 65 and to the lower end of the elevator frame, so that when the lever 63 is moved about its pivot 64, the elevator frame will be rotated about its pivot 30 to lift the lower end of the elevator frame from the ground. A quadrant 67, provided with a plurality of apertures 68, is arranged adjacent lever 63, into which the locking pin 69 on the lever 63 may be inserted to hold the elevator frame in any one of its adjusted positions. In the preferred construction, as shown in Fig. 3, two connecting rods 66 are provided in order that the power for shifting the elevator frame may be balanced and equally applied and lateral thrusts avoided. Both rods 66 are actuated from the single lever 63 through a rock-shaft (see dotted lines Fig. 4) traversing the hollow bar 28 which serves as the support for the forward end of the pyramidal frame 18; the crank arms 65 being mounted at opposite ends of the rock-shaft.

From the above disclosure, it will be seen that the construction thereby provided presents a very compact and efficient machine, capable of being readily moved from place to place with little effort, yet performing work with ease which heretofore has been only possible with larger, heavier and more cumbersome machinery.

The invention is subject to changes and modifications in structure without departing from and within the scope of the appended claim.

I claim:—

In a portable conveyor, the combination of a truck body including front and rear wheels, a vertically extending support mounted thereon, a forwardly and downwardly inclined conveyor mounted on said support and pivoted thereto at a point substantially directly above the rear wheels of the truck body, a lever pivoted on said truck body and a pair of rods operatively connected to said lever and extending from the lowermost end of said conveyor and to their point of operative connection with said lever substantially in the plane of the axis of the rear wheels of said truck body to adjust the inclination of said conveyor and horizontally transmit the thrust thereof when in operation directly to the truck body.

OSCAR B. JONES.