July 9, 1946. A. CHANTLAND 2,403,636

ELEVATOR

Filed Sept. 21, 1944 2 Sheets-Sheet 1

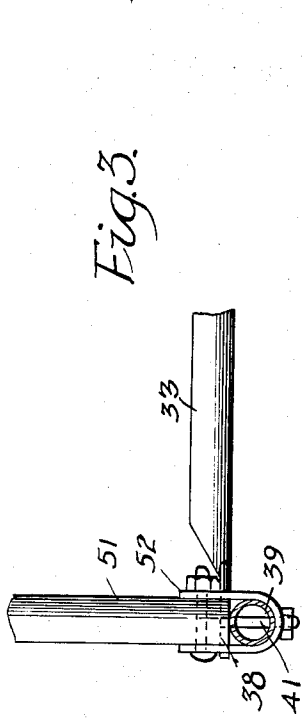


Fig. 3.

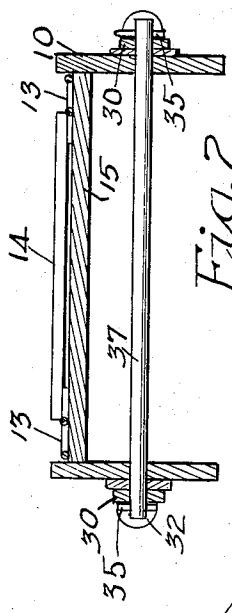


Fig. 2.

Fig. 1.

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Fig. 5.

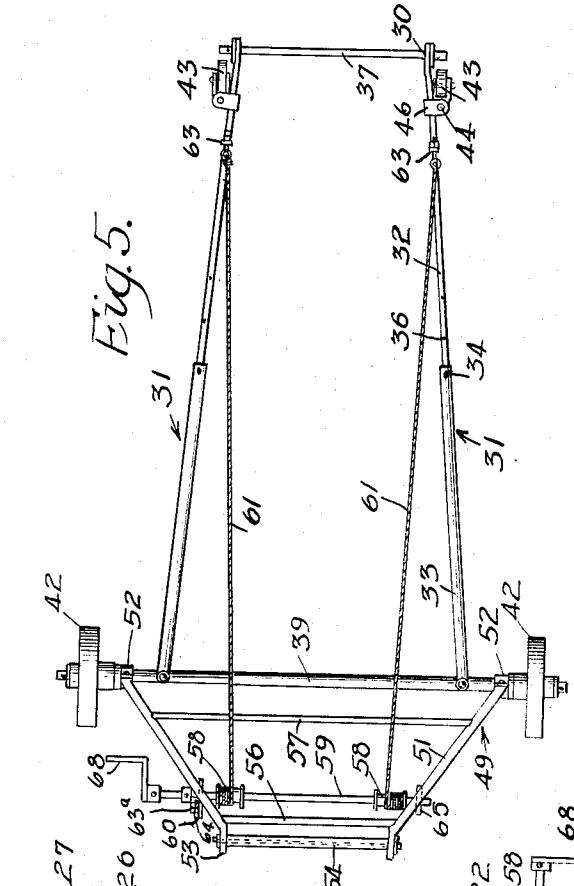


Fig. 6.

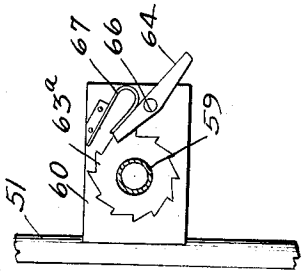
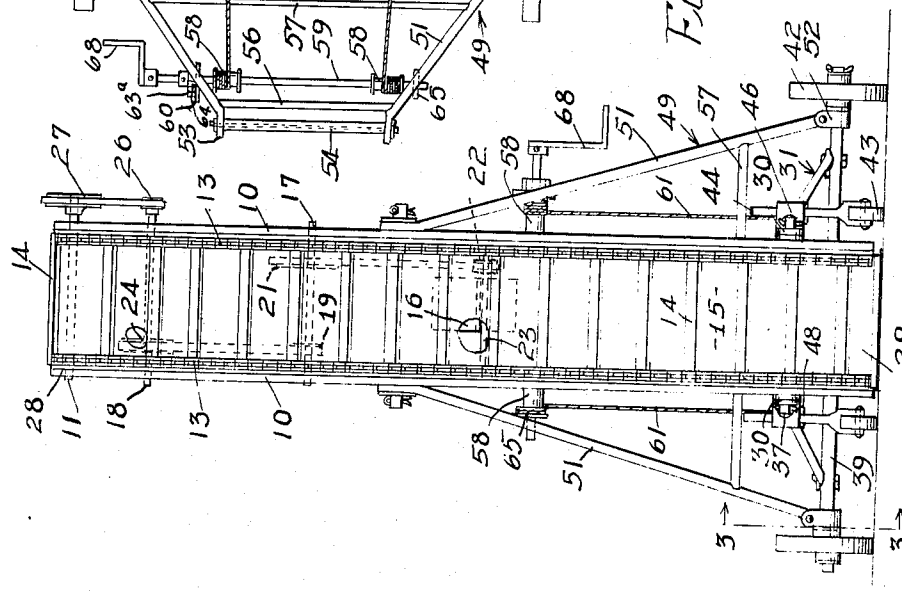


Fig. 4.



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ELEVATOR

Alfred Chantland, Badger, Iowa.

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3 Claims. (Cl. 198—122)

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This invention relates generally to elevators and in particular to a portable elevator adapted for use in warehouses to elevate bags, boxes and the like for stacking and storing purposes, and for elevating articles from a ground surface into a vehicle for shipment.

An object of this invention is to provide an improved elevator.

Another object of this invention is to provide an elevator which is capable of adjustment to and support in any position between substantially horizontal and upright positions.

Yet a further object of this invention is to provide an elevator which is light in weight, capable of being easily maneuvered to a desired operating position by one man, and compactly arranged and assembled as a complete unit within the dimensional confines of a main frame therefor.

A still further object of this invention is to provide an elevator capable of adjustable movement to a position inclined upwardly from its receiving end, and adapted to have its delivery end supported on the ground at varying distances from such receiving end.

A feature of this invention is found in the provision of an elevator adapted to be horizontally positioned for storage and handling purposes, and provided with adjustable supporting means for holding the elevator in an adjusted position inclined upwardly from its receiving end including an extensible horizontal frame pivoted at one end to the receiving end of the elevator. A pivoted frame is fulcrumed to the opposite end of the horizontal frame with its free end in bearing engagement with the under side of the elevator. On pivotal movement of the pivoted frame the inclined position of the elevator is changed, with the extension and contraction of the horizontal frame moving the fulcrum of the pivoted frame longitudinally of the elevator frame to prevent any downward tipping of the delivery end of the elevator.

Other objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawings in which:

Fig. 1 is a side elevational view of the elevator of this invention, with certain parts broken away;

Fig. 2 is a sectional view taken on the line 2—2 in Fig. 1;

Fig. 3 is a fragmentary sectional view as seen on the line 3—3 in Fig. 4;

Fig. 4 is an end elevational view of the elevator looking towards the left in Fig. 1;

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Fig. 5 is a plan view of the elevator supporting means with the elevator removed for the purpose of clarity; and

Fig. 6 is a detail view of a ratchet and pawl device associated with the elevator supporting means.

With reference to the drawings the elevator of this invention is shown in Figs. 1 and 4 as including a main frame comprised of a pair of oppositely arranged upright side members 10. Rotatably supported at each end of the elevator frame and between the side members are shafts 11 carrying gears 12 for movably supporting a conveyor including a pair of chains 13, operatively associated with the gears 12, and cleats or cross members 14 connected between the chains 13. The chains are slidably supported on a board member 15 connected between the tops of the upright side members 10 and extended longitudinally of the main or elevator frame. As best appears in Figs. 1 and 2 the upper ends of the upright side members 10 project above the top surface of the board member 15 and constitute side guides for the elevator conveyor.

The conveyor is driven by an electric motor 16 carried between the side members 10 substantially centrally of the elevator frame, and connected with the conveyor through a transmission system including a pair of shafts 17 and 18 rotatably supported between the side members 10 in a longitudinally spaced relation between the motor 16 and elevator delivery end 28. The shaft 17 carries pulleys 19 and 21 located between the side members 10, with the pulley 21 being belt-connected with a pulley 22 carried on the shaft 23 for the motor 16. The pulley 19 is belt-connected with a pulley 24 mounted on the shaft 18. A second pulley 26 on the shaft 18 is belt-connected with a pulley 27 carried on the shaft 11 at the delivery end 28 of the elevator. The motor 16 is provided with a plug-in attachment (not shown) for connection with a suitable source of electrical supply.

From a consideration of Figs. 1 and 4, therefore, it is seen that the motor 16, conveyor, and transmission system connecting the motor with the conveyor are compactly arranged between the side members 10 and within the upright dimensional confines of the members 10. The elevator is thus capable of being lowered and operated in a substantially horizontal position on the ground surface since no part thereof extends below the level of the under side of the members 10.

The elevator is generally operated at an angle inclined upwardly from its receiving end 29 with

the angle of inclination being dependent upon the elevation to which articles are to be lifted. When the elevator is not in use it is desirable that it be in a substantially horizontal plane to provide for its ready storage and convenient maneuverability without interference from any overhead obstructions.

In the present invention the elevator is adjustably movable for support between substantially horizontal and upright positions by means including a horizontal frame having a pair of telescoping side units 31 arranged at opposite sides of the elevator frame. Each unit 31 includes a member 32 telescoped within a pipe member 33. The members 32 and 33 are held in an adjusted position against relative longitudinal movement by the provision of a pin 34 extendible through the pipe member 33 and through a selected one of longitudinally spaced openings 36 in the member 32. The end 30 of each member 32 is of a flattened form and pivotally supported to the outside of a corresponding side member 10 on a shaft 37 carried between the side members 10 adjacent the receiving end 29 of the elevator (Figs. 1 and 2). Ends 30 are maintained on the shaft 37 by pins 35 projected through opposite ends of the shaft 37. The end 38 of each member 33 is of a flat form and supported on a tubular axle or pipe member 39 extended between the telescoping units 31. Axle 39 is secured to the ends 38 by bolt assemblies 41 (Fig. 3).

It is seen, therefore, that the horizontal frame is pivoted on the shaft 37 adjacent the receiving end 29 of the elevator, with the telescoping units 31 positioned to opposite sides of the elevator and diverged outwardly from each other in a direction toward the axle 39 as best appears in Fig. 5.

Rotatably mounted at each end of the axle 39 is a ground-engaging wheel 42. A pair of wheels 43 adjacent the receiving end 29 of the elevator are rotatably supported at the lower end of a corresponding shank or upright support 44. Each shank 44 is extended through a bracket 46 carried on a member 32 adjacent its pivoted support 37. Adjustment of the elevator receiving end 29 relative to the ground is accomplished by the provision of longitudinally spaced holes 47 in a shank 44 adapted to receive a pin 48 which rests on the top surface of a bracket 46.

A pivoted frame, indicated generally as 49, is comprised of a pair of oppositely arranged spaced members 51 each of which carries a closed U member 52 at one end adapted for pivotal connection with the axle 39 (Figs. 3 and 5). The members 51 are connected together by brace members 56 and 57 and converge inwardly toward their free ends 53 between which a roller 54 is rotatably supported. The elevator frame is receivable on the roller 54 between the free ends 53 which constitute stops or guides for retaining the elevator frame on the roller 54. Thus as shown in Fig. 1 the roller 54 is in bearing engagement against the under side of the members 10 and on pivotal movement of the frame 49 is movable longitudinally of the elevator frame over its complete length to vary the upward inclination of the elevator relative to its receiving end 29.

Pivotal movement of the frame 49 is accomplished by means including a pair of winding drums or pulleys 58 mounted on a shaft 59 extended between the members 51 and rotatably supported in plate members 60 and 65 carried on the members 51 adjacent their free ends 53. A cable 61 is connected at one end with a winding drum 58 and at its opposite end with a bracket 63 supported on a corresponding member 32 near its pivot 37. A ratchet 63a is mounted on the shaft 59 adjacent the supporting plate 60 (Fig. 6) and is operatively associated with a pawl 64 pivoted at 66 on the supporting plate 60 and normally biased into an engaging position with the ratchet 63a by a spring 67. The shaft 59 is manually rotated by a handle or crank 68 mounted at one end thereof to in turn wind and unwind the cables 61 on the drums 58.

In the operation of the adjustable supporting means let it be assumed that the angle of inclination of the elevator is to be decreased from its full line position in Fig. 1 to its dotted line position also shown in Fig. 1. The handle 68 is operated to rotate the shaft 59 in a direction to unwind the cables 61 from the pulleys 58, with the weight of the elevator pivotally moving the frame 49 in a direction toward the elevator delivery end 28 to its dotted line position. This adjusted position of the frame 49 is maintained by the ratchet and pawl mechanism 63a—67 which locks the shaft 59 against rotation.

As clearly appears in Fig. 1 only the guide portions of the ends 53 of the members 51 extend beyond the roller 54 so that regardless of the inclined position of the elevator no part of the pivoted frame 49 is extended beyond the top side of the member 10. As a result the pivoted frame 49 does not interfere at any time with the passage of articles upwardly on the conveyor. In some instances the roller 54 might engage the frame at a distance from the elevator delivery end 28 such that the delivery end will tip downwardly under the weight of articles being elevated. This condition is overcome in the present invention by the provision of the telescoping units 31. Thus by extending the telescoping units 31 the fulcrum for the pivoted frame 49 is movable longitudinally of the elevator toward and away from its receiving end 29 whereby to vary the distance between the roller 54 and the delivery end 28. A solid and adjustable support is thus provided for the elevator frame at all inclined positions, while maintaining some overhang of the delivery end of the elevator relative to the frame 49 to permit an extension of the elevator over the stack of the articles being stored. It will readily be appreciated, of course, that the telescoping units 31 may be adjusted in conjunction with the pivoted frame 49 to incline the elevator at a desired angle.

By virtue of the spaced arrangement of the telescoping side units 31 of the horizontal frame the elevator is capable of being lowered therebetween to a substantially horizontal position, limited by the axle 39, and with the units 31 positioned at opposite sides of the elevator.

From a consideration of the above description, therefore, it is seen that the invention provides a portable elevator which is of a compact and unit assembly, adapted to be adjusted and supported at an inclined position relative to its receiving end between substantially horizontal and upright positions, and with the supporting means at any adjusted position of the elevator being entirely free of the moving parts of the elevator and articles elevated thereby. Adjustment is accomplished by frame means including an extendible horizontal portion, and an upright portion in bearing engagement against the under side of the elevator and adjustable for up and down movement. By virtue of this double adjustment of the frame means the elevator is capable of being

positively supported against any tipping movement while in an inclined position.

Although the invention has been described with respect to a particular embodiment thereof it is to be understood that it is not to be so limited since changes and modifications can be made therein in a manner within the full intended scope of this invention as defined by the appended claims.

I claim:

1. In an elevator comprising an elevator frame, adjustable means for supporting said elevator frame in an adjusted inclined position upwardly from one end thereof including a pair of horizontal telescoping units arranged at opposite sides of said frame and pivoted at one of their ends to said one end of the elevator frame, a shaft connected between the opposite ends of said telescoping units, a pivoted frame pivotally supported on said shaft, means at the free end of said pivoted frame adapted for bearing engagement with the under side of said elevator frame, and means for pivotally moving and holding said upright frame in a pivotally moved position to vary the angular inclination of said elevator frame, with said shaft being movable longitudinally of said elevator frame on actuation of said telescoping units to adjust the fulcrum for said pivoted frame longitudinally of said elevator frame.

2. An elevator comprising an elevator frame including a pair of oppositely arranged upright side members, adjustable means for supporting said elevator frame in an adjusted position inclined upwardly from one end thereof including

a longitudinally adjustable horizontal frame pivotally connected at one end to said one end of the elevator frame, a pivoted frame fulcrumed at one end adjacent the other end of said horizontal frame, means at the opposite end of said pivoted frame adapted for bearing engagement against the under sides of said side members, means for pivotally moving said pivoted frame to vary the inclined position of said elevator frame, and means for releasably holding said pivoted frame in a moved position, with longitudinal adjustment of said horizontal frame moving the fulcrum for said pivoted frame longitudinally of said elevator frame.

3. In an elevator comprising an elevator frame, means providing for the adjustable support of said frame in any position between a substantially horizontal position and a substantially upright position including a horizontal frame having a pair of telescoping side units arranged at opposite sides of said elevator frame, means pivotally connecting said horizontal frame at one end with one end of said elevator frame, a pivoted frame fulcrumed at the opposite end of said horizontal frame, means at the free end of said pivoted frame adapted for bearing engagement with the under side of said elevator frame, and means for pivotally moving and holding said pivoted frame in a moved position, with the contraction and expansion of said telescoping units providing for a movement of the fulcrum for said pivoted frame toward and away from said one end of the elevator frame.

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