Dec. 18, 1945. L. JACKSON 2,391,053

BALE ELEVATOR

Filed Oct. 28, 1944 3 Sheets-Sheet 1

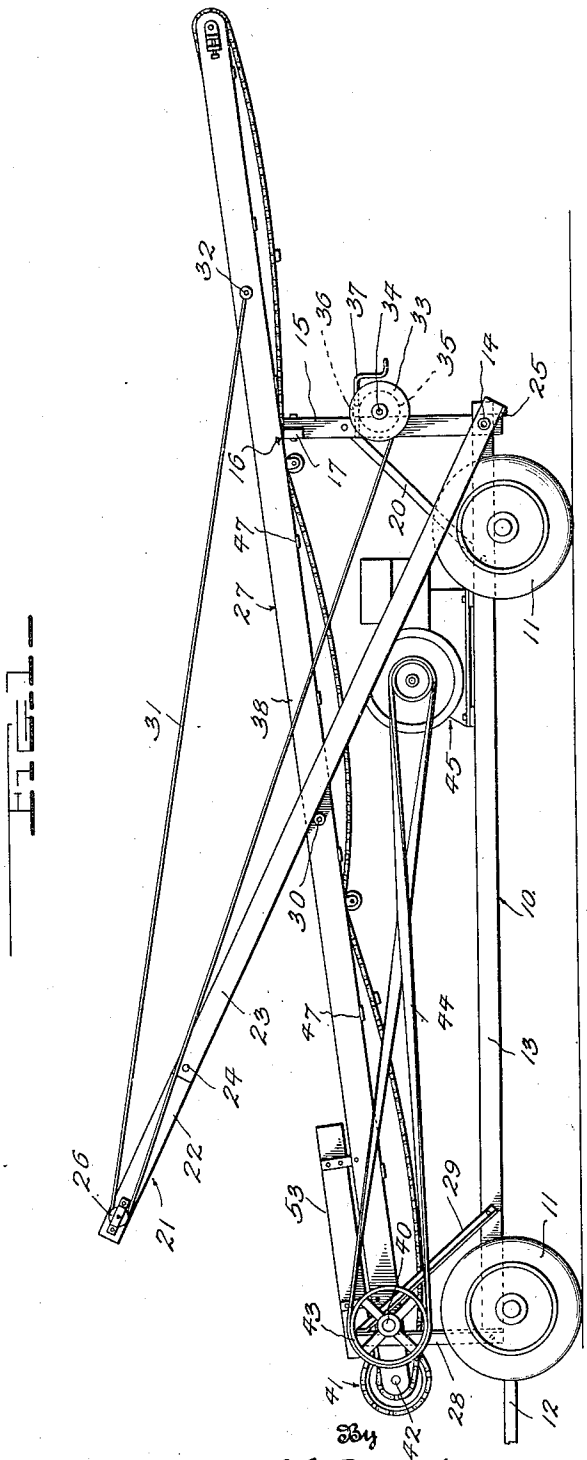


FIG. 1

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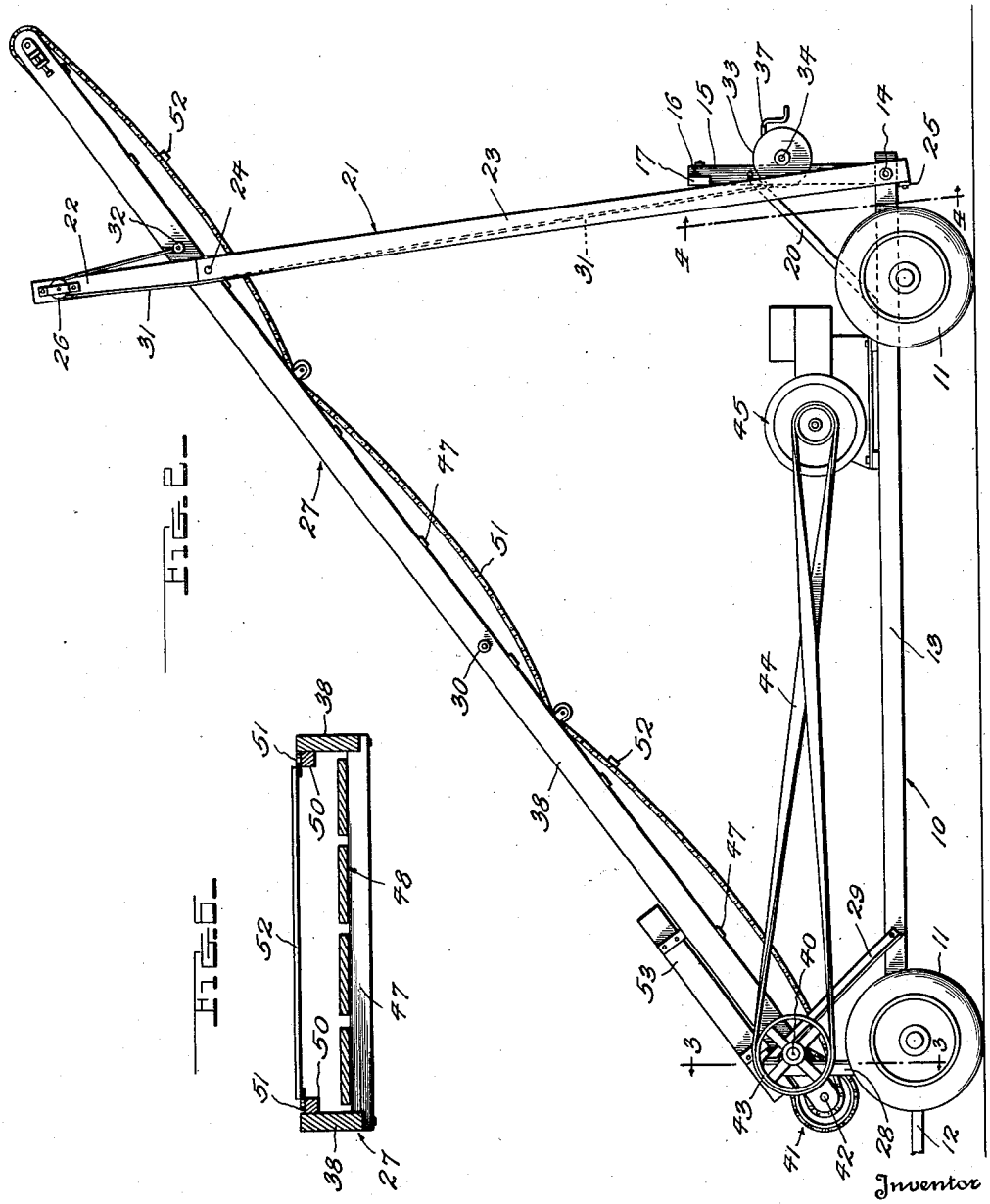


FIG. 2.

FIG. 5.

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FIG. 4.

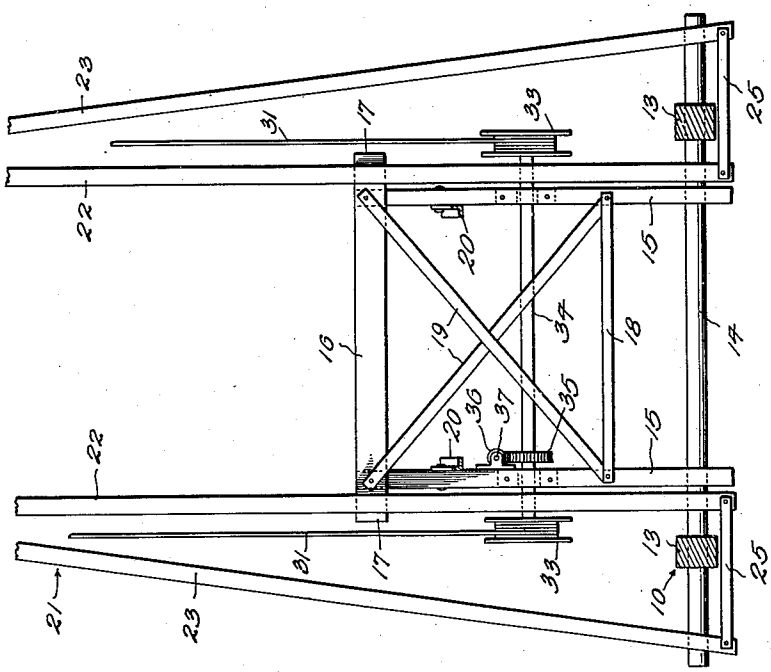


FIG. 5.

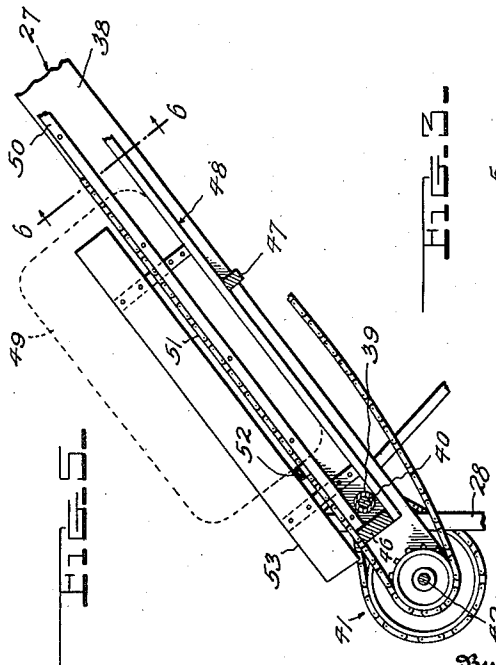
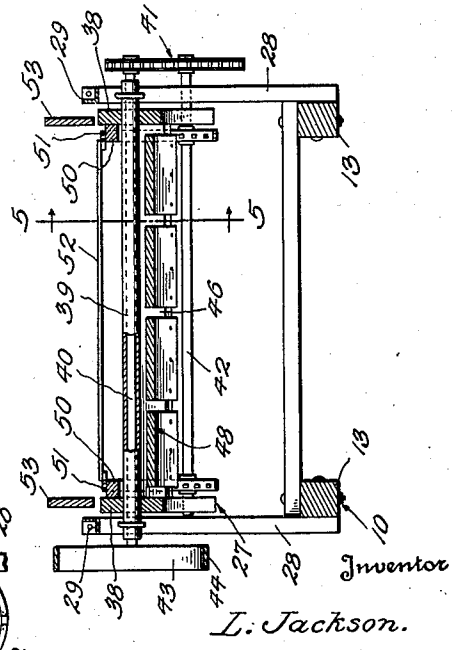


FIG. 3.



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Patented Dec. 18, 1945 2,391,053

UNITED STATES PATENT OFFICE

2,391,053

BALE ELEVATOR

Lewis Jackson, Simpson, Kans.

Application October 28, 1944, Serial No. 560,848

7 Claims. (Cl. 198—122)

The invention relates to a new and improved elevator designed primarily for elevating bales of hay or straw, but not restricted to this particular field of use.

One object of the invention is to provide a simple, inexpensive and efficient machine in which the elevator frame and a derrick frame therefor, are mounted on a chassis and may be supported in lowered idle positions when the machine is to be moved from place to place.

Another object is to provide the chassis frame with an upstanding stop frame which aids in supporting the elevator frame in its lowered idle position and solidly abuts the derrick frame when the latter occupies its vertical operative position.

A further object is to provide a novel construction for mounting the elevator on the chassis frame and transmitting driving power thereto.

Figure 1 is a side elevation showing the elevator frame and the derrick frame in their lowered inoperative positions.

Fig. 2 is a side elevation showing the derrick frame and the elevator in raised operative positions.

Fig. 3 is a transverse sectional view substantially on line 3—3 of Fig. 2.

Fig. 4 is a transverse sectional view on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary longitudinal sectional view through the elevator, on line 5—5 of Fig. 3.

Fig. 6 is a transverse sectional view on line 6—6 of Fig. 5.

The general construction shown in the drawings, may be considered as preferred, and while that construction will be rather specifically described, it is to be understood that variations may be made within the scope of the invention as claimed.

A chassis frame 10 is shown mounted upon wheels 11 and having a tongue 12, said chassis frame having longitudinal side bars 13. A transverse cylindrical bar 14 preferably formed from a piece of pipe extends from one of the side bars 13 to the other at the rear ends of said side bars, and projects outwardly beyond these bars. The bar 14 preferably extends snugly through openings in the bars 13 and is suitably secured to the latter. Two standards 15 are supported by the transverse bar 14, said standards being spaced inwardly from the side bars 13 of the chassis frame 10, the lower ends of said standards having openings through which said bar 14 extends. A transverse top bar 16 is secured to the upper ends of the standards 15 and has its ends 17 projected outwardly beyond said standards. The standards 15 are also connected by a lower bar 18 and crossed brace bars 19, and said standards are braced to the chassis frame 10 by means of inclined braces 20. The elements 15, 16, etc., thus constitute a rigid upstanding frame disposed in a vertical transverse plane and performing functions hereinafter set forth.

A derrick frame 21 is provided, said derrick frame including longitudinal side bars 22 and longitudinal brace bars 23, the upper ends of said brace bars being secured at 24 to said side bars 22. These side bars are pivotally mounted at their lower ends upon the transverse bar 14 and are located between the standards 15 and the chassis frame side bars 13, and the brace bars 23 are pivotallly mounted upon the projecting ends of said bar 14, said bars 22 and 23 preferably having openings through which said bar 14 passes. Each brace bar 23 is connected at its lower end with the adjacent side bar 22, by a strap 25 to prevent relative inward or outward movements of these bars. The upper end of each side bar 22 carries a sheave 26 for a purpose to appear.

An elevator frame 27 is pivotally mounted upon rigid posts 28 which rise from the front end of the chassis frame 10 and are braced thereto by suitable braces 29. This elevator frame is swingable from the lowered idle position shown in Fig. 1 to any of various inclined operative positions, one of which is shown in Fig. 2. When the frame 27 occupies its lowered position, it rests solidly upon the top bar 16 which is secured to the standards 15. This elevator frame is provided with lateral stops 30 upon which the side bars 22 of the derrick frame 21 rest when said derrick frame is in the lowered idle position shown in Fig. 1. When this derrick frame occupies its raised operative position, however, as seen in Fig. 2, its side bars 22 rest solidly against the projecting ends 17 of the top bar 16. It will thus be seen that the vertical transverse frame which includes the top bar 16, performs a twofold function of aiding in supporting the elevator frame 27 when this latter frame is lowered, and stabilizing the derrick frame 21 when this derrick frame occupies its raised operative position. The upstanding stop frame also helps to take off side thrusts and it acts as a support for the winding drums or winches hereinafter described.

Two cables 31 are secured at 32 to the upper portion of the elevator frame 27, said cables being trained around the sheaves 26 and being

wound upon two winches 33 on a transverse shaft 34 mounted in appropriate bearings on the standards 15. Any suitable provision may be made for rotating the shaft 34 to drive the winches 33. For illustrative purposes, a worm gear 35 is shown on the shaft 34 and meshing with a worm 36 on a hand-rotated shaft 37. When the frames 21 and 27 are lowered as in Fig. 1, winding of the cables 31 on the winches 33 will first effect upward swinging of frame 21 until it solidly abuts the ends 17 of the top bar 16, and will then elevate frame 27 as required. By paying out the cables 31 from the winches, both frames may be lowered by gravity.

The frame 27 of the elevator includes parallel side bars 38, the lower end portions of which are pivotally mounted upon a tubular bar 39 which is suitably secured to the posts 26. A shaft 40 is rotatably mounted in the tubular bar 39 and projects beyond the ends thereof. One end of shaft 40 is connected by a chain and sprocket or other drive 41 with one of the sprocket shafts 42 of the endless elevator. The other end of shaft 40 is provided with a pulley 43 driven by a belt 44 from a gas engine or the like 45 mounted on the chassis frame 18. A suitable clutch (not shown) may be employed to stop or start the shaft 42 whenever required.

At points near their lower ends, the side bars 38 of the elevator frame 27 are connected by a transverse bar 46 (Figs. 3 and 5), and said side bars are similarly connected at their upper ends. At intervals between their ends, these side bars have their lower portions connected by transverse bars 47. Secured to the various transverse bars, is a suitably slatted bottom 48 to slidably support the bales or the like to be elevated, one bale being illustrated in dotted lines at 49 in Fig. 5. Above the floor 48, there are two rails 50 which are secured to the inner sides of the side bars 38, the upper edges of said rails being downwardly spaced a slight extent from the upper edges of said side bars. Two conveyor chains 51 which are engaged with the sprocket shafts of the elevator frame 27, have their upper reaches disposed upon the rails 50, and said chains are connected at widely spaced intervals, by means of transverse bale-pushing bars 52. These bars 52 are thus held sufficiently far above the floor 48 to prevent them from possibly riding under the rounded lower corners of the bales being elevated. These bales are simply dropped onto the floor 48 between the guide boards 53, and each bale thus deposited is pushed upwardly along the floor 48 by the next pusher bar 52 to arrive. The bales can thus be elevated with much less strain on the endless driven elevator means than if they were actually carried by the latter.

It will be seen from the foregoing that the machine is comparatively simple and inexpensive, that it may be readily drawn from place to place, may be quickly and easily conditioned for use, and may be conveniently employed in rapidly elevating bales, for example, when stacking them for storage.

While excellent results are obtainable from the general construction shown and described, attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. An elevator comprising an elongated chassis frame, an elevator-carrying frame pivotally mounted adjacent one end thereof, an upstanding stop frame fixedly mounted adjacent the other end of the chassis frame and disposed in a plane transverse thereto, an open derrick frame to receive and cross said elevator-carrying frame and pivotally mounted at one of its ends adjacent the lower end of said stop frame, said elevator-carrying frame being swingable from a lowered idle position in which it contacts with and rests on said stop frame to an inclined operative position, a stop on the intermediate portion of said elevator-carrying frame, said derrick frame being swingable from a lower idle position in which it contacts with and rests on said stop to a vertical operative position in which its intermediate portion abuts one side of the top portion of said stop frame, a cable guide adjacent the free end of said derrick frame, a cable winding drum, and a cable passed around said cable guide and having one end attached to said elevator-carrying frame adjacent the free end of the latter and its other end wound on said drum, whereby when the drum is operated to wind the cable thereon, the derrick frame will first swing upwardly against said stop frame and then the elevator-carrying frame will swing upwardly to an operative position.

2. An elevator comprising an elongated chassis frame, an upstanding stop frame fixedly mounted on one end of said chassis frame and disposed in a plane transverse thereto, a derrick frame pivotally mounted on said one end of said chassis frame, said derrick frame being swingable from a lowered idle position to a vertical operative position in which its intermediate portion abuts the upper portion of said upstanding stop frame, an elevator frame pivotally mounted on the other end of said chassis frame, said elevator frame being swingable from a lowered idle position in which it rests on said upstanding stop frame to an inclined operative position, means for successively swinging said derrick frame and said elevator frame from said lowered idle position to said operative position, and elevating means on said elevator frame; together with stop means projecting laterally from said elevator frame and located to support said derrick frame when these two frames occupy said lowered idle position.

3. A structure as specified in claim 1; said upstanding stop frame having parallel vertical side standards and a horizontal top bar secured to said standards, said top bar serving to support said elevator frame in its lowered idle position; said derrick frame having side bars at the outer sides of said standards, the ends of said top bar projecting outwardly beyond said standards to abut said side bars of said derrick frame when the latter occupies its vertical operative position.

4. In an elevator, a chassis frame having side bars, a fixed transverse bar extending from one of said side bars to the other and having its ends projected outwardly beyond said side bars, two standards spaced inwardly from said side bars and connected with said transverse bar, braces connecting said standards with said side bars, a derrick frame having side bars pivotally mounted on said transverse bar between said chassis frame side bars and said standards, said derrick frame also having brace bars pivotally mounted on said outwardly projected ends of said transverse bar, a horizontal top bar secured to said standards and having projecting ends abutted by said derrick frame side bars when in vertical position, and means for holding said derrick frame in said vertical position.

5. In an elevator, a base, spaced posts secured to and rising from said base, a tubular horizontal bar extending from one of said posts to the other and secured to said posts, an elevator pivotally mounted on said tubular bar and including a sprocket shaft parallel with the same, a second shaft rotatably mounted in said tubular bar and projecting beyond the ends thereof, driving means connected with one end of said second shaft, and driving connections from the other end of said second shaft to said sprocket shaft.

6. An elevator comprising an elongated chassis frame, an upstanding stop frame fixedly mounted on one end of said chassis frame and disposed in a plane transverse thereto, a derrick frame having its lower end pivotally mounted on said one end of said chassis frame adjacent the base of said stop frame, said derrick frame being swingable from a lowered idle position to a vertical operative position in which its intermediate portion abuts one side of the top portion of said stop frame, an elevator-carrying frame pivotally mounted on the other end of said chassis frame and positioned to extend across and through said derrick frame, said elevator-carrying frame being swingable from a lowered idle position in which it contacts with and rests on said stop frame to an inclined operative position, laterally projecting stops on said elevator-carrying frame to be engaged by the intermediate portion of said derrick frame to support said derrick frame when in its lowered idle position, a cable operatively related to said elevator-carrying and derrick frames, and means for actuating said cable to first swing said derrick frame upwardly against said stop frame and then swing said elevator-carrying frame from its lowered idle position to said operative position.

7. An elevator comprising an elongated chassis frame, an upstanding stop frame fixedly mounted on one end of said chassis frame and disposed in a plane transverse thereto, a derrick frame having its lower end pivotally mounted on said one end of said chassis frame at the base of said stop frame, said derrick frame being swingable from a lowered idle position to a vertical operative position in which its intermediate portion abuts one side of the top portion of said stop frame, an elevator-carrying frame pivotally mounted on the other end of said chassis frame, said elevator-carrying frame being swingable from a lowered idle position in which it contacts with and rests on the top of said stop frame to an inclined operative position, laterally projecting stops on said elevator-carrying frame to be engaged by said derrick frame to support the latter in its idle lowered position, a pulley mounted on the upper part of said derrick frame, a winding drum mounted on an intermediate portion of said upright stop frame, a cable attached to the upper part of said elevator-carrying frame and then passed over said pulley and wound upon said drum, and means for operating said drum.

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