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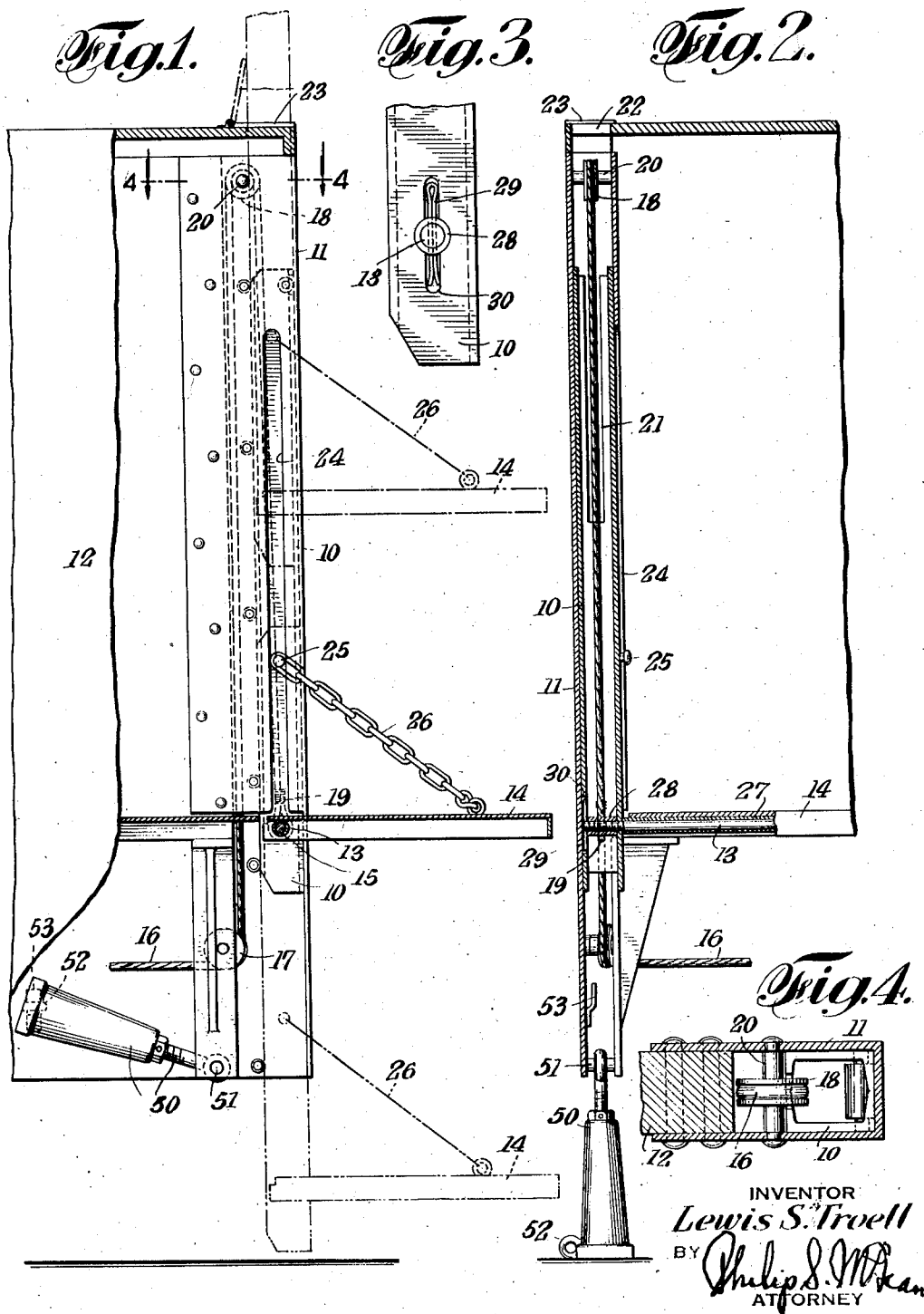
L. S. TROELL

1,977,655

TAIL GATE ELEVATOR

Filed July 24, 1933

3 Sheets-Sheet 1



Oct. 23, 1934.

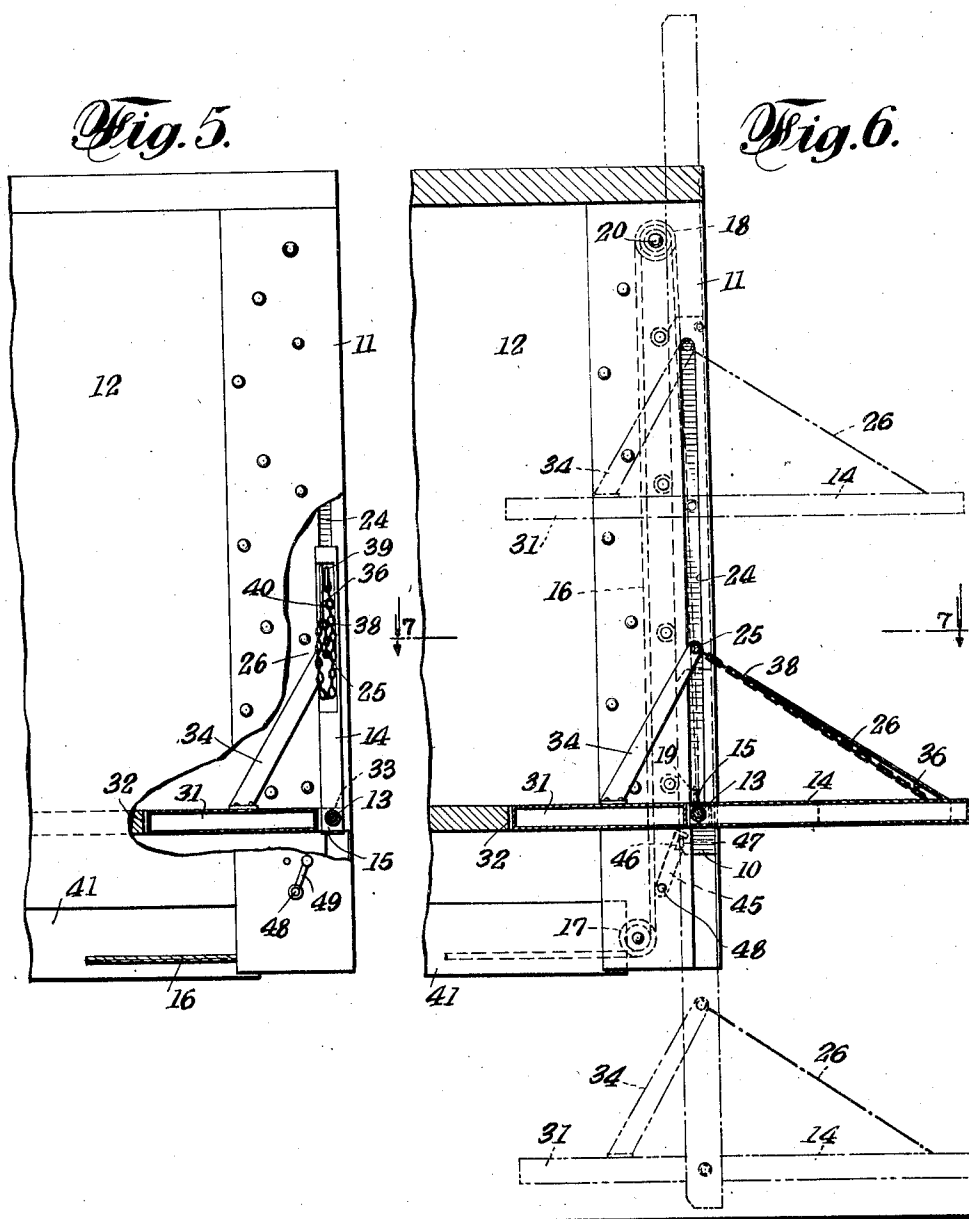
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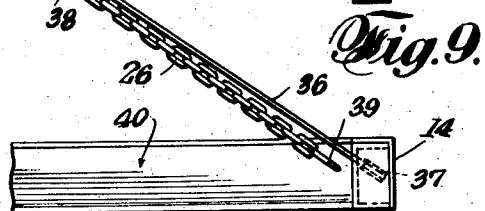
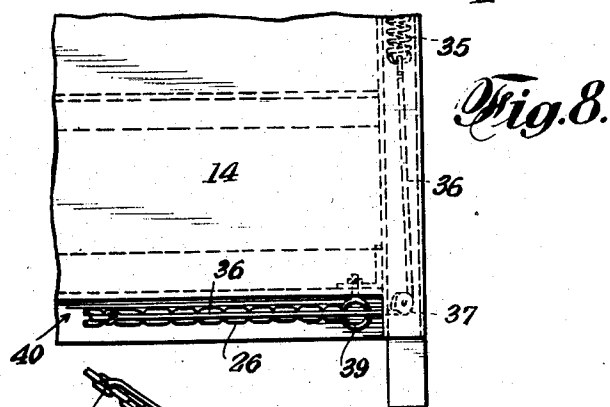
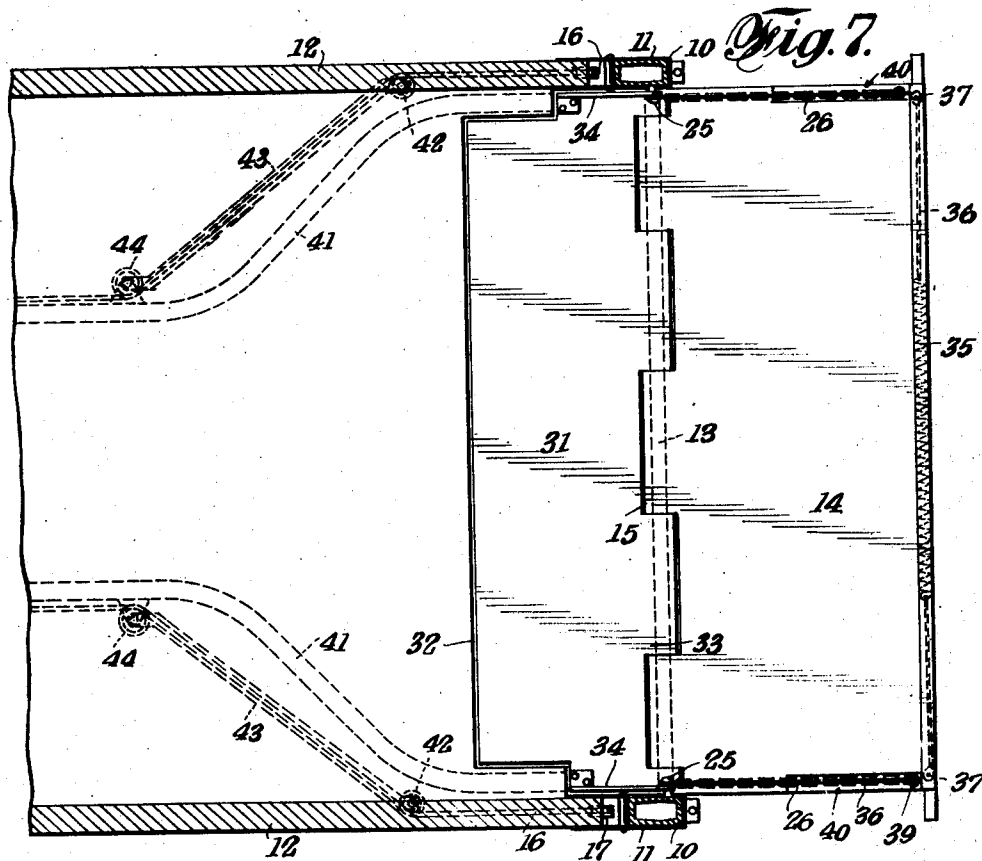
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,977,655

TAIL GATE ELEVATOR

Lewis S. Troell, Brooklyn, N. Y.

Application July 24, 1933, Serial No. 682,002

10 Claims. (Cl. 214-75)

This invention relates to apparatus of the character covered in Troell Patent 1,919,608 of July 25, 1933, and the objects of the present invention are to improve devices of this nature, particularly in the following respects; to enable operation of the elevator for packing objects in tiers or layers in the truck and utilizing the tail gate to hold and protect the two or more tiers; to enable the handling of larger articles than could ordinarily be accommodated on a normal size tail gate; to counterbalance the tail gate which in a device of this character may be a relatively massive and heavy piece; to simplify and make better in operation and appearance the locks for securing the elevator structure and other parts, such as the supports for the tail gate, etc.

Other desirable objects and the novel features of construction, combinations and relations of parts by which such objects are attained are hereinafter described, illustrated and broadly covered in the claims.

The drawings accompanying and forming part of the specification illustrate certain preferred embodiments of the invention, it being understood that the actual structure may be modified and changed to meet various requirements within the true spirit and scope of the invention.

Fig. 1 in the drawings is a broken side elevation of a form of the elevator tail gate as applied to a truck body, broken lines indicating different positions of the tail gate.

Fig. 2 is a broken part sectional rear elevation showing the supporting jack turned downward into active relation.

Fig. 3 is a broken enlarged detail of the lower portion of one of the elevator rams.

Fig. 4 is an enlarged cross-sectional view as on line 3-3 of Fig. 1.

Fig. 5 is a broken side elevation showing a modified form of the invention, in which the elevator structure is extended inward as a movable part of the floor of the truck.

Fig. 6 is a broken and part sectional side elevation similar to Fig. 1, illustrating different positions in this form of the device.

Fig. 7 is a horizontal sectional view as on line 7-7 of Fig. 6, showing the tail gate and floor extension of the same in plan.

Figs. 8 and 9 are broken plan and edge views respectively of the tail gate counterbalancing means.

The forms of the invention herein illustrated are like the patent structure above identified, in consisting of rectangular cross-section sliding

rams or shoes 10, operating in the boxes or guides made up of the angularly bent U-shaped housings 11, secured over the ends of the truck sides 12, these rams being connected at their lower ends by a stay rod 13, on which the tail gate 14, is pivotally hung at 15.

Also, as in the basic patent, a cable or cables 16, connected with suitable hoisting mechanism are used, being led upward over sheaves 17, at the lower ends of the guides and downward over sheaves 18, in the tops of the guides to the hinge or stay rod 13. In the present case however, the cables are shown as dead-ended to this rod as at 19, instead of operating over pulleys thereon as in the patent.

Another feature of distinction is that the upper pulley sheaves have their journals 20, set back or inward from the rams as shown in Fig. 1, so that the rams may ride up past such pulleys, which then extend partly through slots 21 in the near sides of the rams.

The rams are made long enough to slide freely when heavily loaded and hence when fully raised may have to extend through openings 22, provided in the top of the truck. Such openings may be closed normally as by self-closing hinge flaps 23, or the like.

The broken lines in Fig. 1 illustrate the full extent of travel of the tail gate, it being noted that the same may be lowered to ground or sidewalk level to receive an object and then be run up to the floor level of the truck as in full lines, or be further elevated to carry objects thereon into the plane of a top tier within the truck. The slots 24 in the inner sides of the guide boxes for the anchorage pins 25, for the tail gate chains 26 are shown as extended high enough to permit this extended movement. The tail gate may be closed and lifted to an intermediate position, where it will effectively protect and close in both upper and lower tiers.

The rams are spaced in the illustration by a spacing sleeve 27, surrounding the stay rod, and nuts are indicated at 28, turned up on the outer threaded ends of the rod within the hollow box structure of the rams. To prevent accidental loosening of these nuts, keys 29 are shown as extending therethrough and through the rod, said keys in turn being held against dislodgment by being located within confining slots 30, Fig. 3, in the aligned sides of the rams.

For handling more bulky articles taking up greater floor space, the construction such as shown in Figs. 5 to 9, may be employed, the same comprising in addition to the actual tail gate, an

extension 31, projecting into a similarly shaped cutout portion 32, in the back of the truck floor. This forwardly projecting tail gate extension is indicated as having hinge eyes or hinge leaves 33, engaged over the spacing sleeve of the tail gate bolt in similar manner to the tail gate, but as this extension does not ordinarily need be hinged, the same may be simply secured in the horizontal relation by angularly extending braces 34, connected with the chain anchor pins 25.

As will be quite apparent from Figs. 5, 6 and 7, this two piece form of tail gate enables the handling of larger base objects than would be possible with a one piece tail gate of practical size.

In the larger capacity tail gate elevators, the tail gate itself becomes quite massive and heavy and the closing of the same requires considerable strength.

In the modified construction described, the weight of the tail gate is counterbalanced to an extent by a spring 35, concealed in the hollow rear portion of the tail gate, Fig. 7, and connected at its ends with cables 36, running around pulleys 37, in the corners of the structure to points of connection at 38, with the tail gate supporting chains 26. The lower ends of the chains are shown connected with swivel eyes 39, which will turn to line the eyes with the chains and the inwardly or upwardly facing side edges of the tail gate are shown as recessed at 40, to receive and house the links of chain pulled slack by the spring stressed cables, Fig. 5. This latter view shows how the tail gate in the folded or closed relation completely covers the supporting chains and cables and it will be clear from this view, in conjunction with Fig. 6, that as the gate is lowered, the pull will come on the cables and be communicated to the spring which, yielding will store up a counterbalancing force for aiding in the lifting and closing of the tail gate.

To allow for extension of the elevator structure into the flooring of the truck as in Fig. 7, the sills of the truck frame may be spread or bottle-necked as indicated at 41. This permits the gate extension to ride up and down through the end portion of the truck frame and with such construction, the hoisting cables are carried forward a distance from the lowering sheaves 17 to sheaves 42, and then angled inward through guides 43, to pulleys 44, from whence they are led to the hoist mechanism.

To guard against accidental lifting as well as lowering of the elevator structure, special latches or locking dogs may be provided, such as indicated at 45, Fig. 6, having recesses 46, angled to hold against movement in both directions and receiving correspondingly angled lugs 47, on the lower ends of the rams. These locking dogs are shown as carried by a transverse shaft 48, journaled in the guides forwardly of the rams and provided at one or both ends with a suitable operating handle or handles 49.

At times, and particularly in handling the heavier loads, it becomes desirable to level the truck body more or less and to fixedly anchor and support it while the elevator is in use. To provide for this, screw jacks such as indicated at 50, may be attached to lower ends of elevator guides, the same being shown in the illustration as pivoted thereto at 51, so that they may be swung upward into supported relation with the eyes 52, at the lower ends of the same caught over sustaining hooks 53, inside the guides, or be swung down into operative relation with the pavement.

What is claimed is:

1. In combination, a truck, a tail gate and elevator mechanism connected with said tail gate for lowering the same to positions beneath the truck floor and to positions in line with and above the truck floor for single or double tiering, means for locking the tail gate in the position of alignment with the floor against movement in either a raising or lowering direction, said means including a releasable dog with an angular recess and a correspondingly angled lug engageable therewith, the latter being on a ram operating with the tail gate and the dog being mounted on stationary guide structure for said ram.

2. A tail gate elevator comprising rams, a stay rod connecting the same in spaced relation, a tail gate hinged on said rod, securing means for said rod engaged on the end portions of the same within the rams, fastening keys for said securing means extending through said securing means and projecting therefrom, said rams having recesses receiving and holding the projecting portions of said securing means.

3. In combination with a truck body having openings in the roof of the same, guides at the sides of said truck body beneath said openings, rams operating in said guides and up through said roof openings, a tail gate structure carried by said rams, elevator structure for raising and lowering said rams either within the confines of the truck body or for extending the same up through said roof openings and closures hinged on the roof of the truck body and positioned for automatically opening to passage of the rams and adapted to close the roof openings as the rams lower therethrough.

4. In combination, a truck body and a tail gate therefor, guides at the ends of the sides of the truck body, rams operating in said guides, a stay rod connecting said guides and supportably connected with said tail gate, the end of the truck body floor being cut away and an extension from the tail gate structure also mounted on said stay rod and projecting into said floor opening to close the same when the tail gate is levelled with the floor.

5. In combination, a truck body having elevator guides at the ends of the same, rams operating in said guides, a rod connecting the lower portions of said rams, a tail gate hinged on said rod and a tail gate extension supported on said rod and projecting forwardly from the tail gate into the body of the truck, the flooring at the end of the truck being cut out to receive said extension as a part of the actual floor when the tail gate elevator is levelled with the floor structure and means for definitely positioning and securing said rams with the hinged tail gate and forwardly projecting tail gate extension levelled with the floor structure of the truck body.

6. In combination, a truck body having elevator guides at the ends of the same, rams operating in said guides, a rod connecting the lower portions of said rams, a tail gate hinged on said rod and a tail gate extension supported on said rod and projecting forwardly from the tail gate into the body of the truck, the flooring at the end of the truck being cut out to receive said extension as a part of the actual floor when the tail gate elevator is levelled with the floor structure, the truck having a frame which is widened at the rear to accommodate said floor forming extension of the tail gate and hoist means for the rams extended about said widened portion of the truck frame.

7. In combination, a hinged tail gate, a counterbalancing spring housed therein, cables connected with said counterbalancing spring and supporting chains for the tail gates, said cables being connected with intermediate portions of said supporting chains.

8. In combination, a hinged tail gate, a counterbalancing spring housed therein, cables connected with said counterbalancing spring, supporting chains for the tail gates, said cables being connected with intermediate portions of said supporting chains and said tail gate having recesses therein for receiving and housing exposed portions of the cables and supporting chains.

9. In combination, a hinged tail gate, means for supporting the same in the lowered position, a tail gate weight counterbalancing spring housed within and extending transversely in the back portion of the tail gate, pulleys at the rearward corners of the tail gate and cables extending from said spring about said pulleys and anchored at their ends to thereby apply energy stored in the

spring to the lifting of the tail gate, the lowering of the tail gate serving to store said energy and the supporting means taking the weight off said counterbalancing spring connections as the tail gate reaches the desired lowered position.

10. In combination, a truck body having elevator guides at the end of the same, hoisting pulleys journaled in the upper ends of said guides, hollow rams operating in said guides and having slots in the sides at the upper ends of the same receiving said pulleys when the rams are elevated in the guides, a stay rod connecting the lower ends of the rams and having end portions extending into said hollow rams, hoisting cables extending from said pulleys downward through the hollow rams and connected with said end portions of the stay rods, said cables being aligned with said slots in the upper ends of the hollow rams to enable said rams to be extended up past the pulleys and a tail gate structure supported by the stay rod between the rams.

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