Jan. 2, 1951 E. S. PATTON 2,536,080

LOADING AND UNLOADING LIFT FOR TRUCK BODIES

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FIG. 1.

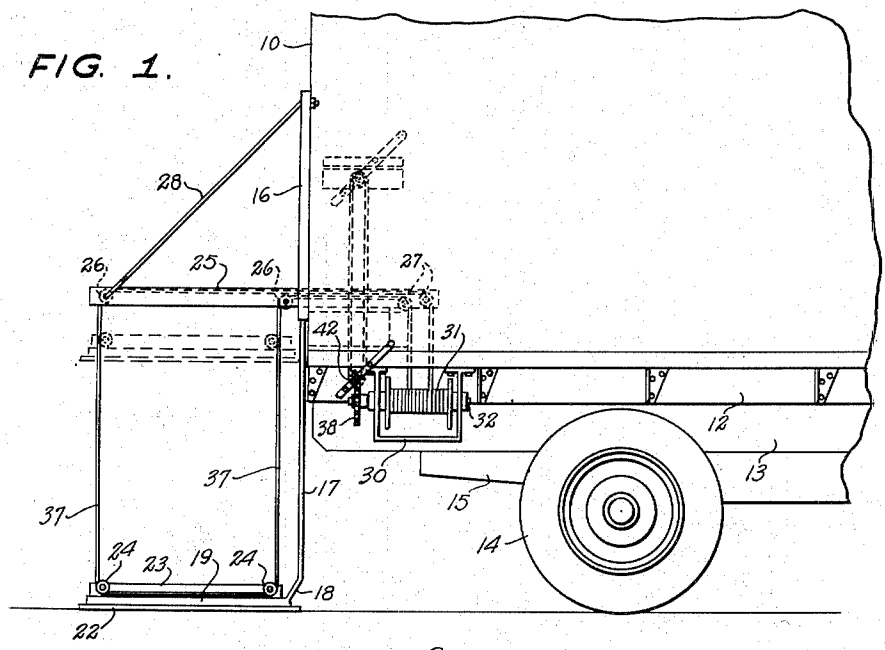


FIG. 2.

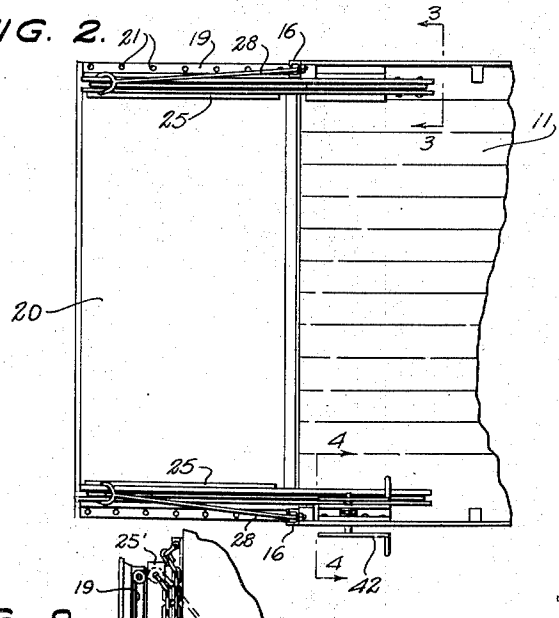


FIG. 8.

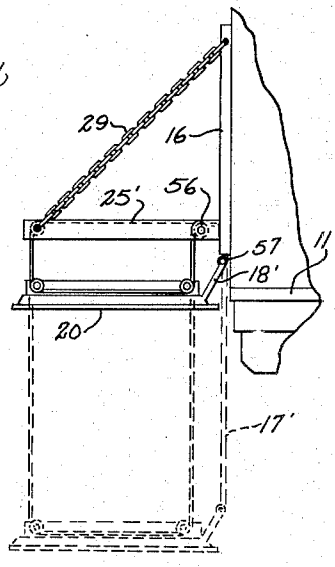
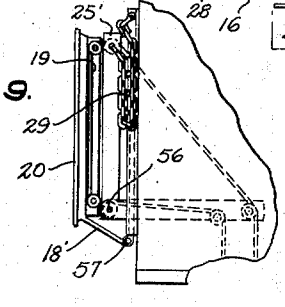


FIG. 9.



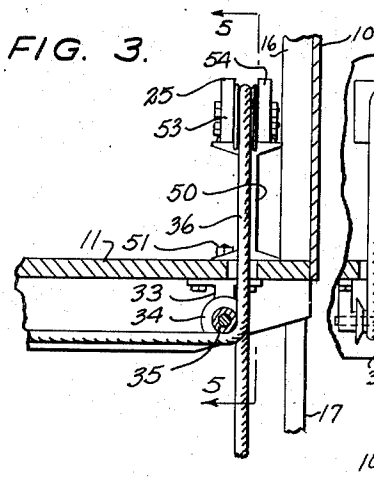
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FIG. 3.



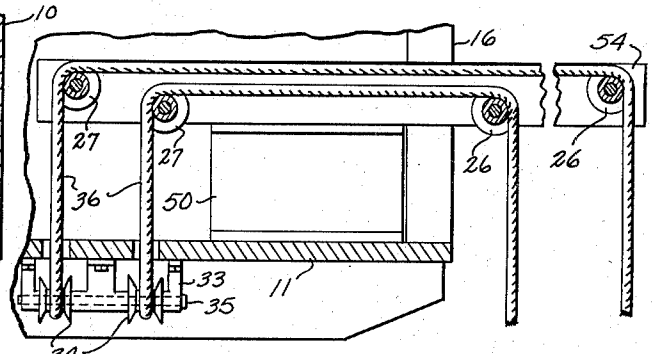


FIG. 5.

FIG. 4.

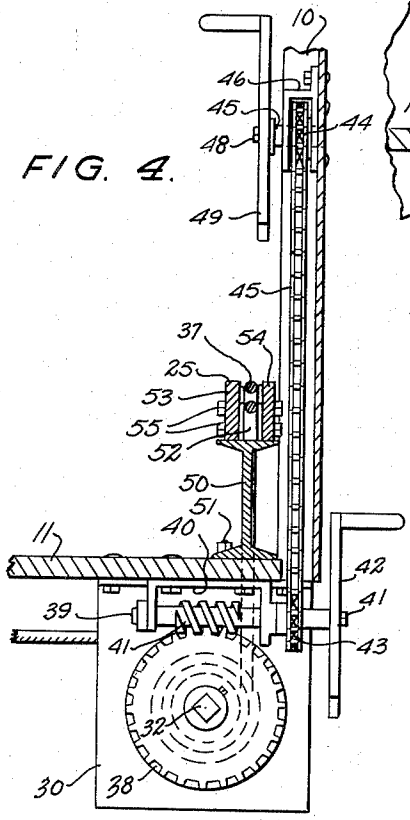
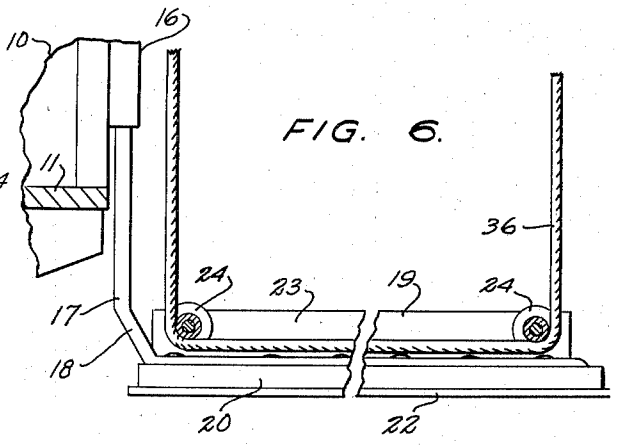


FIG. 6.



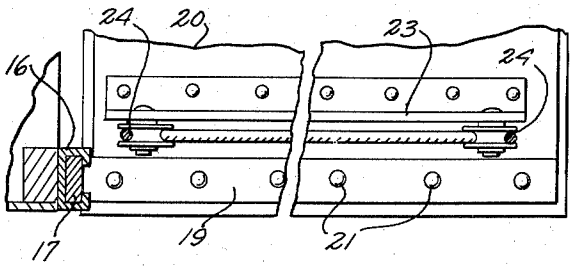


FIG. 7.

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LOADING AND UNLOADING LIFT FOR TRUCK BODIES

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Application January 4, 1949, Serial No. 69,173

2 Claims. (Cl. 214—75)

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This invention relates to loading and unloading lifts for truck bodies, and more particularly to a combined loading lift and gate mechanism.

It is frequently necessary to move heavy objects into or out of a truck body at a location where no loading platform is available. With the ordinary truck construction this requires heavy manual lifting, an excessive amount of time and labor, and presents a hazard of personal injury or damage to the article being loaded or unloaded.

It is among the objects of the present invention to provide a loading and unloading lift mechanism, which can be manually operated by a single operator to lift heavy objects from the ground to the level of the truck body floor or to lower such objects from the body floor level to the ground, which lift mechanism is simple and rugged in construction, can be applied to a conventional truck body without material modification of the body structure, is firmly guided in its lifting and lowering movements so that it is not necessary to have the truck body floor substantially level for operation of the mechanism, which can be operated from either inside or outside the truck body, and which includes a lift platform which can also be used as a gate to close a loading and unloading opening in a truck body.

Other objects and advantages will become apparent from a consideration of the following description and appended claims in conjunction with the accompanying drawings, wherein:

Figure 1 is a side elevation of a fragmentary rear portion of a truck body with loading and unloading mechanism illustrative of the invention applied to the body;

Figure 2 is a top plan view of the fragmentary rear portion of the truck body and lift mechanism illustrated in Figure 1;

Figure 3 is a transverse cross-section on an enlarged scale taken on the line 3—3 of Figure 2;

Figure 4 is a transverse cross-section on an enlarged scale of a fragmentary portion of the truck body and lift mechanism taken on the line 4—4 of Figure 2;

Figure 5 is a longitudinal cross-section of a fragmentary portion of the truck body and lift mechanism taken on the line 5—5 of Figure 3;

Figure 6 is an end elevation of a fragmentary portion of the lift mechanism;

Figure 7 is a top plan view of a fragmentary end portion of the lift mechanism, a portion of the lift mechanism and a fragmentary portion of the truck body being shown in transverse cross-section;

Figure 8 is a side elevation similar to Figure 1,

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showing a somewhat modified form of lift mechanism wherein the lift platform is pivotally mounted for use as a tail gate to close the lower part of the rear opening of the truck body; and

Figure 9 is a side elevation similar to Figure 8, showing the lift mechanism in closing position.

With continued reference to the drawings, the numeral 10 indicates a conventional truck body, having an opening such as a rear opening for receiving and discharging cargo. This body has a floor 11, mounted on longitudinal frame beams 12, supported on the truck chassis frame 13, which is in turn supported on conventional rear wheels 14 by conventional spring suspensions 15.

A pair of guideways 16 are secured to the rear end of the truck body and disposed, one guideway at each side of the rear body opening in substantially vertical position. Each of these guideways comprises a metal tube of rectangular cross-sectional shape, having a longitudinally-extending medial slot in its rearwardly directed side, when the guideway is operatively mounted on the truck body. These guideways have their bottom ends disposed above the floor level of the truck body and extend upwardly a sufficient distance to provide firm and positive guideways for the lift mechanism, so that it is not necessary to have the floor of the truck body substantially level when using the lift mechanism. Respective guides 17, in the form of straight, elongated rods of rectangular cross-section, are slidable in the guideways 16, between a position, as illustrated in full lines in Figure 1, in which their bottom ends are substantially on the ground at the rear of the truck, and a position, as indicated in broken lines in Figure 1, in which their bottom ends are substantially at the floor level of the truck body. Each of these guides has near its bottom end a rearwardly inclined, short portion 18, and a rearwardly directed, substantially horizontal portion 19 extending from the bottom end of the portion 18, and provided with spaced apertures for receiving rivets or bolts. An elongated, rectangular platform 20 is secured at its ends to the rearwardly extending portions 19 of the guide 17 by suitable bolts or rivets 21 extending through the rearwardly-directed portions 19 of the guides and through the platform near the opposite ends of the latter.

The platform 20 has a length substantially equal to the width of the rear opening of the truck body and a width substantially the same as that of a conventional truck body tail gate, and may be used as a tail gate for closing the lower portion of the rear body opening, if de-

sired. This platform may be of any desired construction and, as illustrated, comprises an outer flat plate 22 which may be either metal or wood, with a frame on the upper or inner side of the plate 22 and preferably an inner plate covering the frame.

Angle irons 23 are attached to the platform, one angle iron adjacent each rearwardly-extending guide portion 19, and each angle iron providing an upstanding leg near the inner edge of the corresponding guide portion 19. The angle irons are secured to the platform by suitable rivets or bolts similar to the rivets or bolts 21. A pair of cable sheaves 24 are journalled on the upstanding leg of each angle iron 23 and disposed one sheave near each end of such leg, that is, one sheave near the rear and one near the front corner of the platform at each end of the latter.

A pair of brackets 25 are secured to the truck body at the inner sides of the body side walls above the lower level of the body and project rearwardly from the body substantially parallel to the floor 11. Each of these brackets is in the form of a beam composed of two spaced-apart metal bars of rectangular cross-sectional shape and extend rearwardly of the body a distance substantially equal to the width of the platform 20, and inwardly of the truck body a distance slightly less than the distance to which they extend rearwardly of the body. Two pair of cable sheaves 26 and 27 are disposed between the two bars of each bracket 25 and journalled on the bars for rotation about axes extending transversely of the bracket and disposed substantially parallel to the floor 11. A respective brace 28 is connected at its lower end to each bracket 25 near the outer or rearward end of the bracket and at its upper end to the corresponding guideway 16 near the top end of the latter to support the rearwardly projecting, cantilever portions of the brackets. Each brace 28 may be in the form of a rod, as illustrated in Figure 1, or may be provided as a chain or flexible cable, as illustrated in Figure 8, and indicated at 29.

An inverted, U-shaped bracket 30 is secured to the truck body and below the floor level of the body and near the rear end at one side of the body, and a cable winding drum 31 is journalled in the bracket 30 by a drum shaft 32, which extends through the opposite legs of the bracket and is journalled therein. A three-legged bracket 33 is secured to the truck body at the side of the latter opposite the bracket 30 below the floor level and near the rear end of the body, and a pair of spaced-apart cable sheaves 34 are rotatably supported by this bracket through the intermediacy of an axle pin or shaft 35 extending through cylindrical eyes of the bracket and through the two cable sheaves.

A flexible cable 36 is carried near its mid-length location under the two cable sheaves 24 journalled on the platform 20 near that end of the platform corresponding to the side of the truck body at which the bracket 33 is mounted. The two end portions of this cable are carried over the two sheaves 26 of the pair of sheaves journalled in the bracket 25 to the rear of the truck body and then carried over the two sheaves 27 of the pair journalled in the bracket inwardly of the truck body, are then carried under the two guide sheaves 34 and carried transversely of the truck body under the floor 11 to the cable drum 31, and the ends of the cable are attached to the cable drum so that the cable will be wound upon and unwound off of the drum upon rotation of the drum in the appropriate direction. A second cable 37 is carried under the two sheaves 24 journalled on the platform 20 near the end of the platform corresponding to the side of the truck body upon which the cable drum 31 is journalled. The two end portions of this cable 37 are carried over the two sheaves 26, journalled in the rearwardly extending portion of the corresponding bracket 25 and then over the two sheaves 27 journalled in the portion of such bracket within the truck body and carried downwardly to the cable drum 31 where the two ends of the cable are attached to the drum to be wound onto and wound off of the drum upon rotation of the drum.

When the two cables are wound onto the cable drum 31, the platform 20 is raised, the guide 17 sliding upwardly in the guideways 16, and when the cables are wound off of the drum, the platform is lowered from the rearwardly extending portions of the brackets 25, the guide 17 sliding downwardly in the guideways 16.

A worm gear 38 is secured on one end of the cable drum shaft 32, and a worm shaft 39 is journalled in the legs of an inverted, U-shaped bracket 40 secured to the under surface of the body floor with its worm 41 in meshing relationship with the worm gear 38. The worm shaft 39 is disposed substantially at right angles to the drum shaft 32 and transversely of the truck body and this worm shaft extends at one end outwardly of the adjacent side of the truck body and is provided on such end with a squared or non-circular reduced portion 41, which is receivable in a correspondingly shaped aperture provided in a crank handle 42. The crank handle has two or more such apertures spaced apart longitudinally thereof, so that different leverages can be provided for the crank to raise or lower objects of different weight.

A chain sprocket 43 is secured on the worm shaft 39 and a second sprocket 44 is secured on a shaft 45, journalled in the legs of an inverted, U-shaped bracket 46, secured to the inner side of the body sidewall, immediately above the chain sprocket 43. A link chain 47 drivingly connects the chain sprockets 43 and 44 and the shaft 45 extends from the bracket 46 inwardly of the truck body and is provided at its inner end with a squared or non-circular reduced portion 48 receivable in a correspondingly shaped aperture provided in a crank handle 49, which is similar in all respects to the crank handle 42. As a matter of fact, a single crank handle may be used for operating either the sprocket shaft 45 or the worm shaft 39.

While normally operated means have been illustrated for raising and lowering the platform, it is to be understood that suitable power-operated means may be used instead without, in any way, exceeding the scope of this invention.

It is also to be understood that the lift mechanism may be assembled with the truck body at either side as well as at the rear of the body.

In order to firmly support the brackets 25 in the truck body, short sections of I-beam 50 are disposed between the body floor and the portions of the brackets extending inwardly of the body and these I-beam sections are rigidly secured to the body floor by suitable means, such as the bolts 51, and are secured to the brackets by suitable means including spacers 52 positioned between the two bars 53 and 54 of each bracket. These spaces are secured to the I-beam sections by welding, or other suitable means, and to the bracket bars by through bolts 55.

In the bodied arrangement illustrated in Figures 8 and 9, each of the brackets 25', corresponding to the brackets 25 of Figures 1 and 2, is provided immediately to the rear of the truck body with a pivotal joint 56, so that the rearwardly-extending portion of the bracket can swing upwardly about a substantially horizontal axis. As explained above, a chain 29 is substituted for the brace rod 28 and each of the guides 17', corresponding to the guides 17 in the above-described form of the invention, is provided between its straight portion slidable in the corresponding guideway 16 and the inclined portion 18' with a pivotal joint 57, so that the platform 20 can also pivot upwardly at its rear edge about the common, substantially horizontal axis of the two joints 57 provided in the two guides 16.

With this arrangement, after the cables have been wound on the drum 31 to bring the platform up to the level of the body floor 11, further rotation of the drum in the same direction will continue to wind in the cables and will swing the platform 40 and rearwardly extending portions of the two brackets 25' upwardly about the axes of the pivotal joints 56 and 57 until the platform 20 is disposed in substantially vertical position, extending above the rear end of the body floor 11, and across the rear opening of the body from one side of the body to the other to provide a tail gate for closing the lower portion of the body rear opening. When the platform is thus swung to a substantially vertical position, it does not project rearwardly of the truck body to any material extent and the truck upon which the body is mounted can then be used for long hauls over the highways with the platform in use as a tail gate, closing the lower portion of the rear opening of the body.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. In combination with a truck body having an opening, loading and unloading lift mechanism for said body comprising two normally vertical guideways on said body and disposed, one guideway at each side of the body opening, a guide slidable in each guideway, each of said guides having at its bottom end a portion extending outwardly of said body, an elongated platform secured near its opposite ends to the outwardly extending portions of said guides, a pair of brackets extending outwardly from said truck body above the body floor level and disposed one bracket at each side of said body opening, spaced-apart cable sheaves journalled on each bracket, two pair of spaced-apart cable sheaves journalled on said platform and disposed one pair of sheaves near each end of said platform, a cable winding drum journalled on said body at one side of said opening, a pair of spaced-apart cable sheaves journalled on said body at the opposite side of said opening from said cable drum, a first cable carried under the cable sheaves at one end of said platform, over the cable sheaves on the corresponding bracket, under the cable sheaves journalled on said truck body and secured at its ends

to said cable drum, a second cable carried under the cable sheaves at the opposite end of said platform, over the cable sheaves on the corresponding bracket and secured at its ends to said cable drum, a worm gear disposed at one end of said drum and drivingly connected thereto, a worm shaft journalled on said body and having a worm thereon in meshing relationship with said worm gear, said worm shaft having a crank-handle-receiving portion at one end, a chain sprocket on said worm shaft, a second chain sprocket journalled on said body above said worm shaft and within said body, a crank-handle-receiving portion connected with said last-mentioned chain sprocket, and a chain drivingly connecting said sprockets whereby said cable drum may be rotated by operation of either said worm shaft or said second chain sprocket.

2. Loading and unloading lift mechanism for a truck body having an opening comprising a pair of guideways attachable in substantially vertical disposed position to truck body, one guideway at each side of the body opening, a guide vertically slidable in each guideway, an elongated platform connected near its opposite ends to the bottom ends of said guides, a pair of shave-carrying brackets attachable to said body in substantially horizontal position above the body floor level at opposite sides of the body opening to project outwardly from said body above the ends of said platform, cable sheaves journalled on said sheave-carrying brackets and on said platform near the opposite ends of the latter, a U-shaped bracket attachable to said truck body below one of said sheave-carrying brackets, a cable drum journalled in said U-shaped bracket, a bearing bracket attachable to the body below the other of said sheave-carrying brackets, cable sheaves journalled on said bearing bracket, a first cable passed under the cable sheaves near one end of said platform, over the cable sheaves journalled on the corresponding sheave-carrying bracket, under the cable sheaves journalled on said bearing bracket, and secured at its ends to said cable drum, a second cable carried under the cable sheaves near the opposite end of said platform, over the cable sheaves on the corresponding sheave-carrying bracket and secured at its ends to said cable drum, and flexible braces connected between the outer ends of said sheave-carrying brackets and the upper ends of the corresponding guideways, said sheave-carrying brackets and said guides having pivotal joints therein for movement of said platform between a generally horizontal, load-carrying position and a generally vertical position in which it closes the lower portion of the truck body opening.

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