

- [54] LIFT TRUCK STABILIZING APPARATUS
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180/79; 104/242-243, 137, 246, 245, 120, 119

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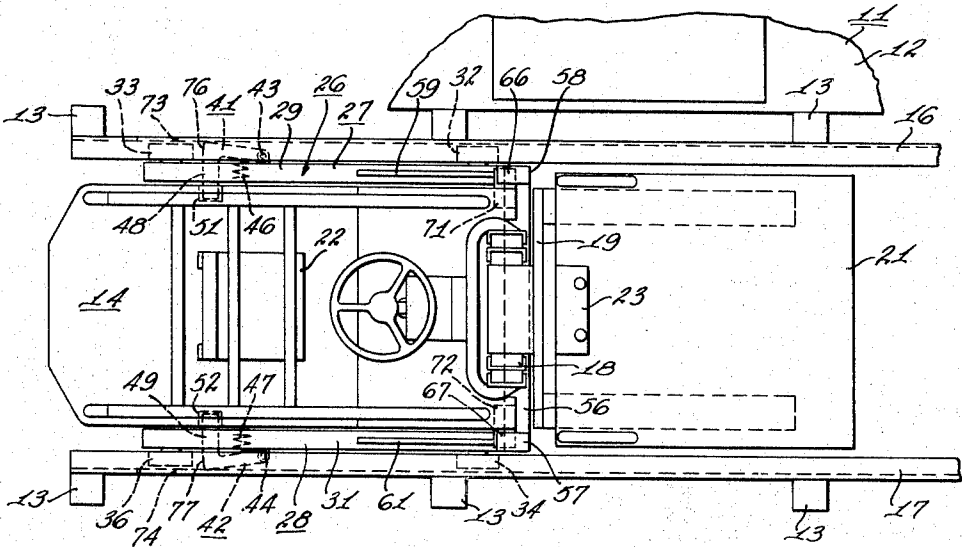
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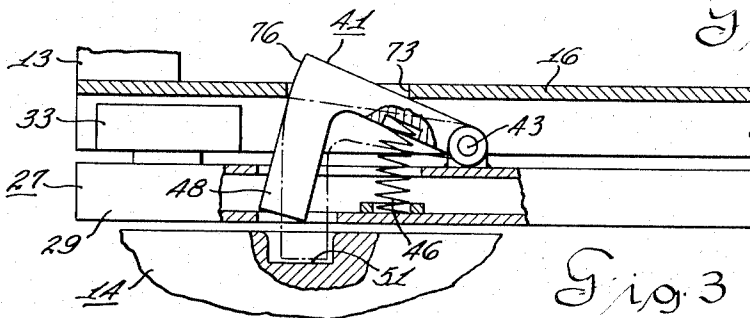
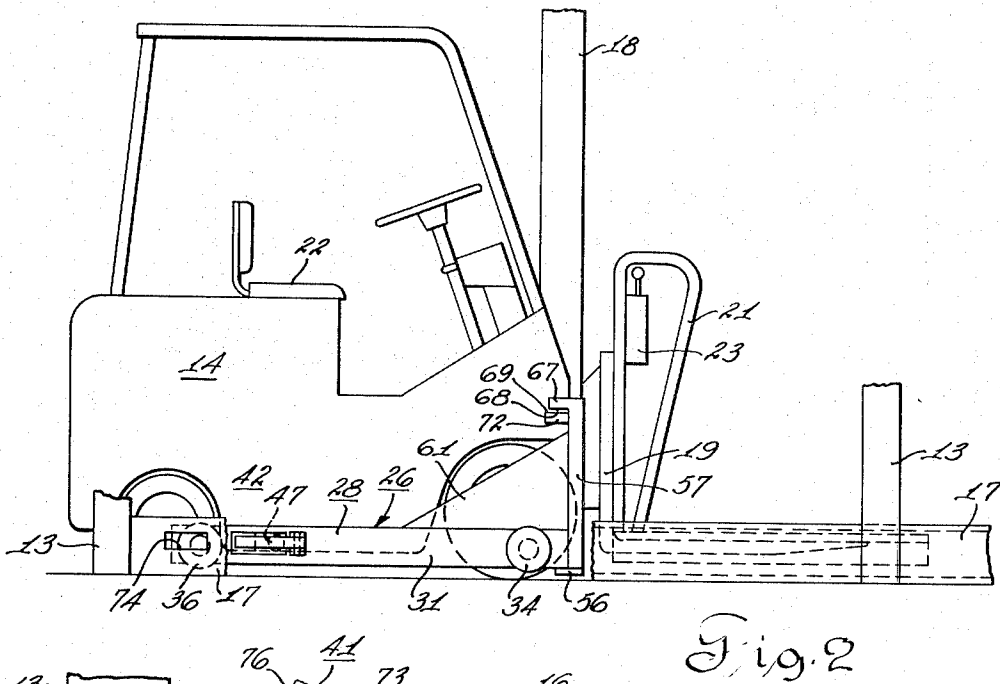
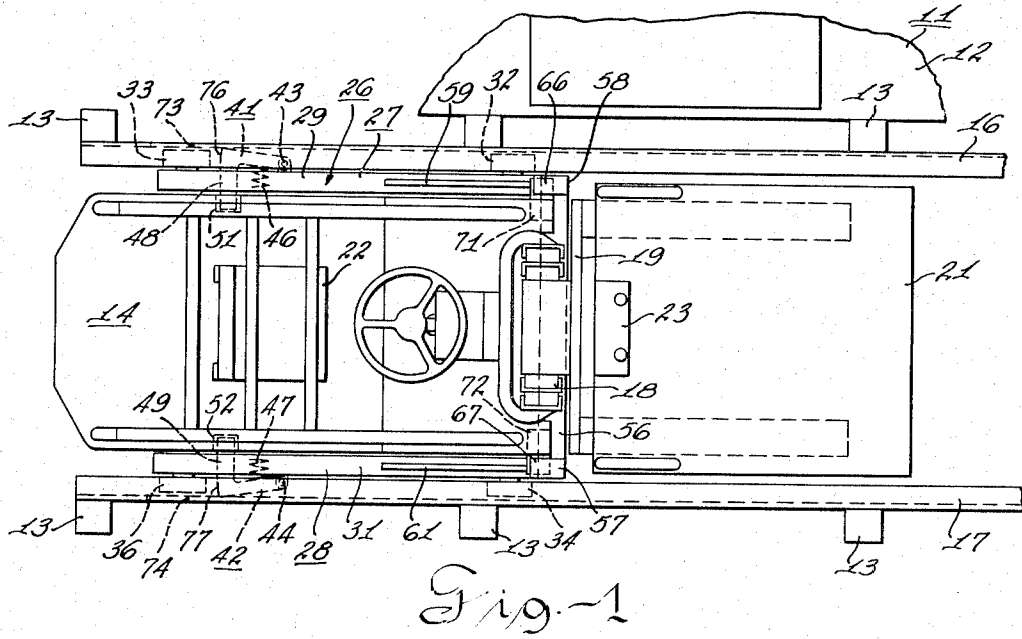
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[57] ABSTRACT

A lift truck is stabilized in the aisle of a material storage facility by a pair of trolleys which travel on parallel horizontal guide rails on opposite sides of the aisle. Releasable connecting means engage the lift truck as it enters the aisle to latch the trolleys to the lift truck as it operates within the aisle. On movement of the truck from the aisle the latch means automatically operate to disconnect the trolleys from the lift truck, the trolleys staying on the guide rails in the material storage facility.

13 Claims, 3 Drawing Figures





LIFT TRUCK STABILIZING APPARATUS

BACKGROUND OF THE INVENTION

Heretofore others have suggested various means to increase the storage density of material storage facilities. It has been recognized that narrower aisles and higher stacking achieve greater storage density in a material handling facility. It is also recognized that when stacking at extreme heights the lift truck must be properly stabilized so as to prevent tilting of the truck.

BRIEF DESCRIPTION OF THE PRESENT INVENTION

The present invention employs a pair of trolleys which ride on rails at opposite sides of the aisle of a material storage facility. Releasable connecting means are provided to releasably secure a lift truck to the trolleys when it is driven into the aisle between the trolleys. The releasable connecting means automatically disconnect the trolleys from the lift truck when the latter is driven from the aisle thereby leaving the trolleys on the rails at the end of the aisle in condition for re-entrance of the lift truck. A primary objective of the present invention is to provide a means for achieving high stacking with a lift truck in a narrow aisle facility while maintaining good lift truck stability. This invention is particularly useful in connection with an order picker type truck engaged in high level retrieval. In an order picker truck the operator is the order picking attendant who rides the carriage of the lift truck up and down to pick the materials from various points in the warehouse, and, in the interest of safety, it is desirable to prevent lateral and forward tilting of the truck.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is incorporated in an order picker lift truck as illustrated by the drawings in which:

FIG. 1 is a top view of an order picker lift truck in an aisle of a material storage facility;

FIG. 2 is a side view of the lift truck illustrated in FIG. 1; and

FIG. 3 is a top view of portions of a guide rail, stabilizing trolley and lift truck showing latching means in a nonlatching position.

Referring to the drawings, a material storage facility 11 includes material receiving shelves 12 mounted on support structures 13 at opposite sides of an aisle in which an order picker lift truck 14 is disposed. A pair of horizontally disposed parallel guide rails in the form of channels 16, 17 are securely fastened to the support structures 13 as by welding. In the illustrated embodiment of the invention, the channels are disposed with their open sides in confronting relation to one another. The lift truck 14 includes a mast 18 and a carriage 19 with order picking station 21. A conventional operator's station 22 is provided for the truck so that the operator may operate the truck in a normal manner when it is not in the aisle of the material storage facility. When the truck is within the aisle of the material storage facility, the operator rides on the order picking station 21 where appropriate controls 23 are located for operating the truck.

A drive-in attachment 26 is provided to releasably connect the lift truck to the guide rails to stabilize the lift truck against lateral and forward tilting. The attachment 26 includes a pair of trolleys 27, 28 with longitu-

dinal members 29, 31 disposed alongside the channels 16, 17 and to which front and rear rollers 32, 33, 34, 36 are rotatably mounted. These rollers are of a size permitting them to be disposed between the upper and lower flanges of the channels 16, 17. The trolleys 27, 28 also includes latches 41, 42 adjacent the rear rollers 33, 36, the latches being pivotally connected to the members 28, 29 on vertical pivot axes 43, 44. The latches are biased toward a nonlatching condition by suitable biasing means in the form of coil springs 46, 47. The latches 41, 42 have abutments in the form of fingers 48, 49 which pass through openings in the vertical walls of the members 29, 31 and in their latching position, as shown in FIG. 1, will extend into cooperative latching parts in the form of pockets 51, 52 in laterally opposite sides of the lift truck 14.

In the illustrated embodiment of this invention the trolleys 27, 28 are interconnected by a transverse beam 56 secured by welding to the lower front end of the members 29, 31. A pair of upright legs 57, 58 are secured as by welding to the forward ends of the members 29, 31 and are reinforced by braces 59, 61. The upper ends of the legs 57, 58 carry brackets 66, 67 having downwardly facing abutment surfaces 68 which are adapted for cooperative engagement with upwardly facing abutment surfaces 69 formed on lugs 71, 72 on laterally opposite sides of the front of the truck. As shown in FIGS. 1 and 2, the truck is operating in the aisle of the material storage facility and the latches 41, 42 have been cammed to their locking positions by the vertical walls of the channels 16, 17. When the operator backs the truck from the aisle the spring loaded latches 41, 42 upon registering with slots 73, 74 in the vertical walls of the channels will swing away from the lift truck about their pivot axes 43, 44 to the nonlatching position shown in FIG. 3. In the nonlatching position of the latches 41, 42 their fingers 48, 49 are withdrawn from the pockets 51, 52 thereby releasing the truck from the drive-in attachment. Abutments 76, 77 on the latches 41, 42 engage abutments on the channels 16, 17 in the form of the longitudinal end surfaces of slots 73, 74, thereby functioning as retaining means preventing withdrawal of the trolleys from the channels 16, 17.

Forward tilting of the lift truck is prevented by the cooperative engagement of the fingers 48, 49 with the top surfaces of the pockets 51, 52. Lateral tilting of the lift truck is prevented by the before-mentioned cooperative engagement of the latch fingers and pockets and also by engagement of the vertically confronting abutment surfaces on brackets 66, 67 and lugs 71, 72. Thus, stability of the lift truck is insured as the order picking operation is conducted in the material storage facility.

The embodiments of an invention in which an exclusive property or privilege is claimed are defined as follows:

1. Apparatus for guiding and stabilizing a lift truck in the aisle of a material storage facility, comprising: cooperative latching parts on opposite lateral sides of said lift truck, support structures at opposite sides of said aisle, a pair of parallel and horizontally disposed guide rails secured to said support structures, respectively, and a pair of laterally spaced trolleys including

a pair of longitudinally extending members disposed alongside said rails, front and rear longitudinally spaced roller means on each of said members adapted for cooperative engagement with said guide rails for longitudinal movement therealong and whereby upward movement of said members is restrained, and releasable connecting means on each of said members operable to engage said cooperative latching parts of said lift truck in response to said latter being driven between said trolleys whereby said trolleys move with said lift truck as the latter moves in said aisle, said apparatus being operative to restrain said lift truck against lateral and forward tilting.

2. The apparatus of claim 1 wherein said releasable connecting means includes a releasable latch shiftable between latching and nonlatching positions which automatically moves to its latching position for cooperative engagement with said lift truck when the latter is driven between said trolleys.

3. The apparatus of claim 2 wherein said releasable latch automatically moves to its nonlatching position for disengagement from said lift truck when the latter is moved from between said rails.

4. The apparatus of claim 3 wherein said latch is moved to its latching position by camming engagement with said rail.

5. The apparatus of claim 4 comprising retaining means preventing withdrawal of said trolleys from said rails.

6. The apparatus of claim 5 wherein said retaining means comprises abutments on said latches and rails which engage when the truck is backed from between said rails.

7. The apparatus of claim 6 wherein said latches are pivotally mounted on said members and further comprising biasing means urging each of said latches toward its nonlatching position.

8. The apparatus of claim 7 wherein said latches include fingers adapted to cooperatively engage pockets in transversely opposite sides of said lift truck when said latches are in their latching position.

9. The apparatus of claim 8 wherein said latches are adjacent said rear rollers, respectively, and wherein

said fingers and pockets cooperate to prevent tilting of said truck.

10. The apparatus of claim 9 and further comprising a transverse beam rigidly secured to and extending between the front ends of said members.

11. The apparatus of claim 10 and further comprising a pair of transversely spaced brackets secured to the front ends of said trolleys having downwardly facing abutment surfaces adapted for cooperative engagement, respectively, with upward facing abutment surfaces on opposite lateral sides of the front of said truck.

12. Apparatus for guiding and stabilizing a lift truck in a material handling facility of the type having support structures on opposite sides of an aisle, comprising:

cooperative latching parts on opposite lateral sides of said lift truck a pair of parallel and horizontally disposed guide rails fixedly secured to said support structure at opposite sides, respectively, of said aisle, and

a pair of laterally spaced stabilizing trolleys reciprocally mounted on said rails, respectively, each including

front and rear rollers cooperatively engaging the associated rail and

latch means mounted on said trolleys and operable to connect said trolleys to said lift truck by engagement with said cooperative latching parts in response to said truck being driven between said trolleys and rails, and means in said guide rails operable to disconnect said trolley from said lift truck in response to said truck being driven from said aisle.

13. The apparatus of claim 12 wherein said trolleys each includes a frame member and wherein said rollers and latches are pivotally mounted on said frame members and further comprising means automatically operating said latches on movement of said truck into said aisle between said trolleys to releasably connect said trolleys to said truck and automatically operating said latches on subsequent movement of said truck from said aisle to release said truck from said trolleys.

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