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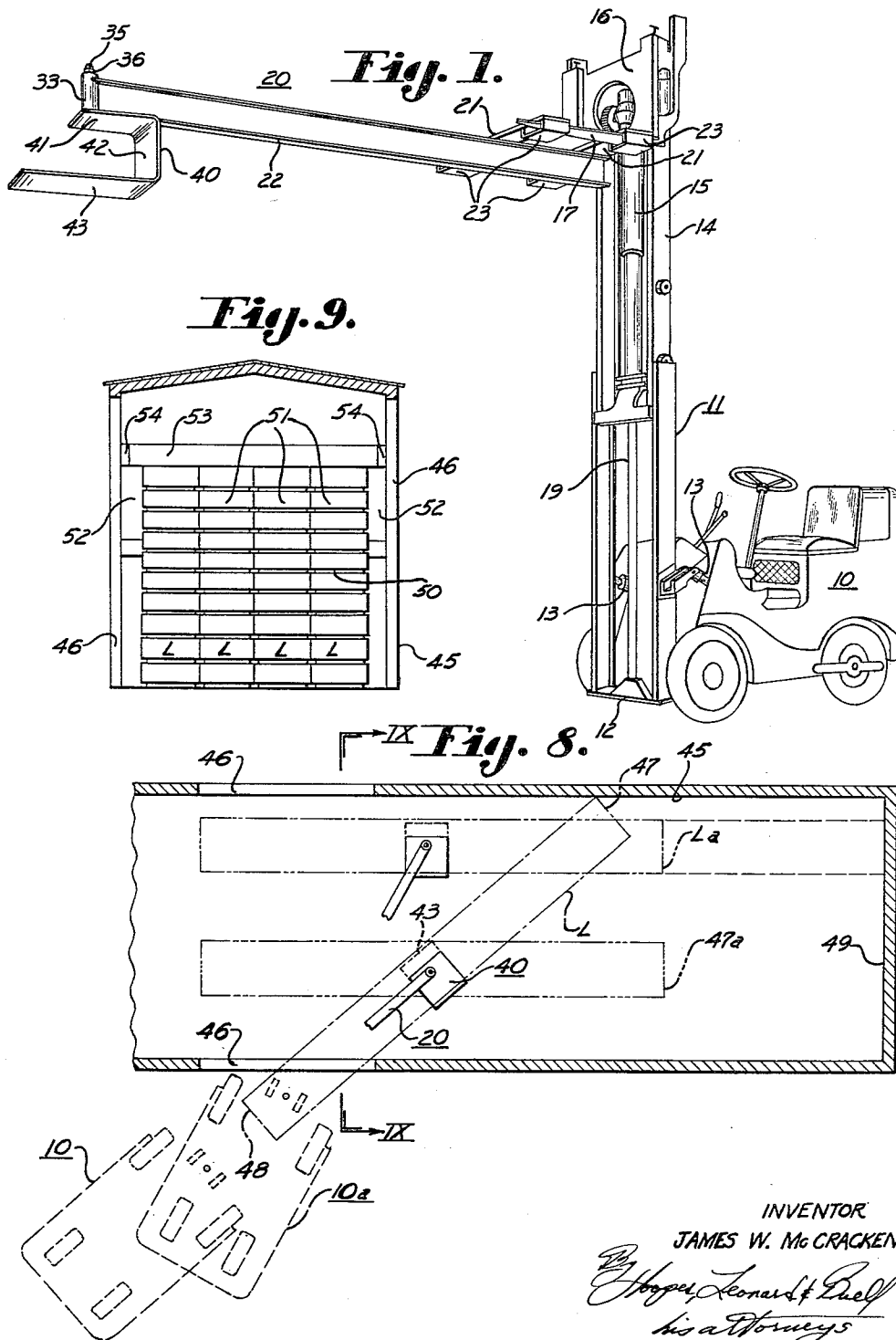
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3,050,206

LOAD HANDLING SYSTEM

Filed Nov. 18, 1958

3 Sheets-Sheet 1



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Fig. 3.

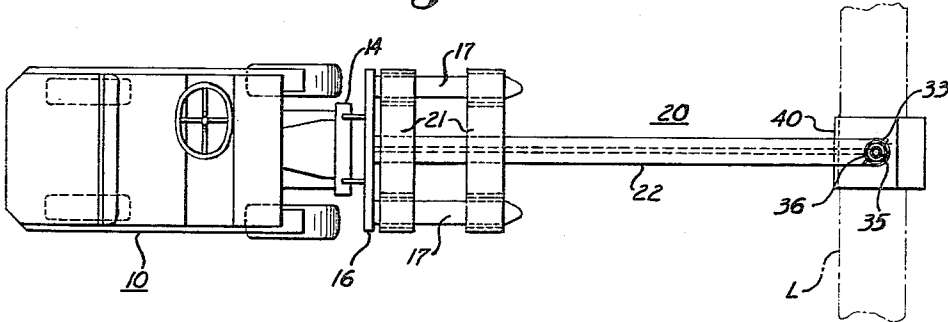
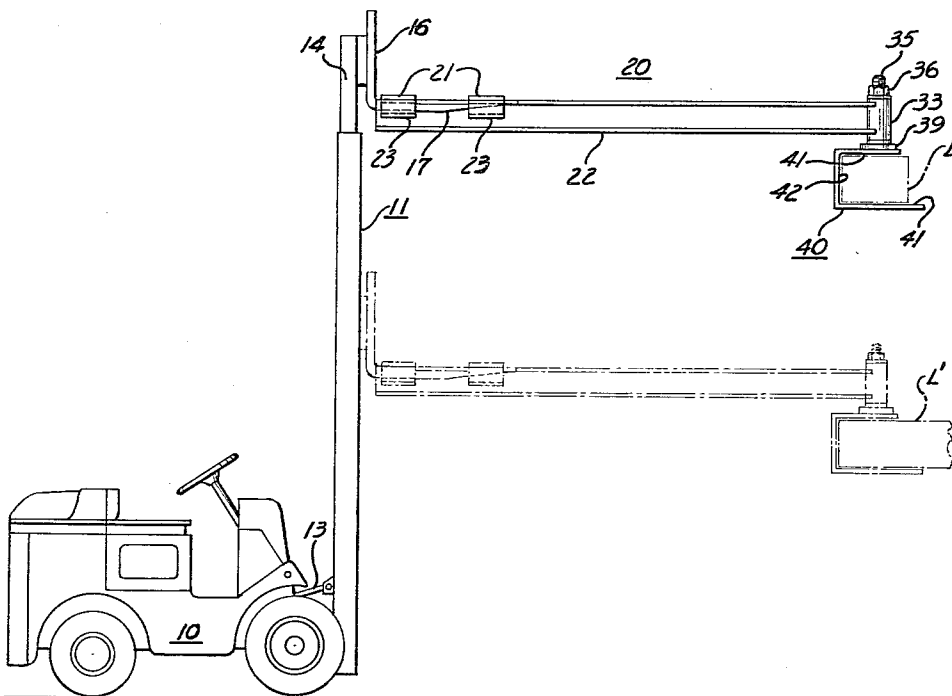


Fig. 2.



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LOAD HANDLING SYSTEM

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This invention relates to load-handling attachments and method of loading material such as modular bundles of lumber. More particularly, my invention pertains to such an attachment for handling equipment such as a fork lift truck and to a system for the handling of lumber or the like, whereby, for example, standard railroad box cars or other carriers may readily be loaded and unloaded.

While increasing attention has been paid to the palletizing of many materials for the handling thereof in comparative bulk, facile and rapid handling of lumber because of its greatly varied sizes and lengths has considerably lagged. Recently, I proposed the use of a modular bundle for the packaging, counting and handling of lumber from manufacturer to ultimate consumer based on a formula which enables module units to be made up of relatively uniform rectilinear size containing a readily ascertainable quantity in the sizes and lengths desired. Two or four such units atop one another and adhesively banded together produce a modular package of lumber for ready handling. However, relatively inexpensive means for mechanically lifting and conveying such modular packages have been lacking, particularly of a kind for ready attachment to existing materials-handling equipment such as fork lift trucks. This invention provides such a means useable with mobile or immobile materials-handling equipment and also enables such modular packages to be loaded into and out of a standard box car from one side thereof with a tremendous saving in labor costs and time required.

Other objects, features and advantages of this invention will be apparent from the following description and the accompanying drawings, which are illustrative only, in which—

FIGURE 1 is a perspective view of a load handling attachment of this invention attached to a fork lift truck;

FIGURE 2 is a side view of the equipment shown in FIGURE 1 illustrating a vertical movement in the course of the handling of a modular package of lumber;

FIGURE 3 is a plan view of such equipment;

FIGURE 4 is a plan view on an enlarged scale of a load handling attachment embodiment of this invention illustrated in the preceding figures;

FIGURE 5 is a view in side elevation of the attachment shown in FIGURE 4;

FIGURE 6 is an end view taken along line VI—VI of FIGURE 5;

FIGURE 7 is a view on a somewhat larger scale of inner and outer end portions of such attachment more particularly showing the releasable means for connecting the attachment to the lift equipment and the pivotal connection for the lift member of the attachment;

FIGURE 8 is a plan view partly in section of a standard box car employing the load handling system of this invention; and

FIGURE 9 is a view in elevation and section taken along line IX—IX of FIGURE 8 showing a lumber pile loaded and braced in such car.

Referring to FIGURES 1 to 7, inclusive, of the drawings, there is shown a conventional fork lift truck 10 with a main hydraulic elevator 11 on the front thereof supported on a step 12 in somewhat fore-and-aft tiltable relation to the truck body by means of tilting cylinder mechanism 13. The truck is provided at the rear end thereof with weights for counterbalance. Elevator 11 is provided with an extension 14 carrying a cylinder 15

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which cooperates with a piston therein connected to a plunger 19 so that upon manipulation of valves by an operator of vehicle 10 the extension 14 may be raised or lowered, and the tilting mechanism 13 operated to the extent, if any, selectively desired. A standard fork lift head 16 is secured to the upper end of extension 14, said head having two forwardly and horizontally extending prongs 17 together comprising the fork portion of head 16. Vertical holes 18 are provided in the prongs 17 of the fork for a purpose to be described.

One embodiment of my load handling attachment is illustrated in such figures. That attachment comprises a plurality of longitudinally spaced and transversely extending frame bars 21 rigidly connected together to a boom 22 shown in the form of a beam welded to the underside of bars 21. Each of the bars 21 has the ends of a U-shaped band 23 welded to the underside thereof to form a sleeve defining an enclosure 24 at the end of each bar to each side of beam 22 in longitudinal alignment with a respective prong 17, the enclosures 24 being open at the front and back ends thereof. The underside of each sleeve band 23 is drilled and tapped for engagement by a set screw 25 which can be tightened up against the underside of the fork lift 17 when attachment 20 is connected thereto to hold the two rigidly together. Each of the forward enclosures 24 has registering openings 26 drilled therethrough as shown in FIGURE 7, the upper such opening being counterbored at 27, in registry with the respective holes 18. A movable pin 28 having a wider head 29 to fit in counterbore 27 is provided so that when the openings are in respective registry, pin 28 provides a positive lock against any possibility of longitudinal movement between head 16 and attachment 20. Head 29 of each pin 28 may be provided with a ring 30 to be connected by a chain or flexible cable 31 to a further ring 32 screwed into the back edge of the forward bar 21 so that the pins cannot readily become misplaced or lost.

The outer end portion of beam 22 is rigidly welded to a bearing sleeve 33 having bushings 34 therein, the axis through such sleeve being vertical. A pivot bolt 35 extends upwardly through sleeve 33 in rotatable relation thereto and is retained in assembled relation by a castle nut 36 held in position by a cotter pin 37 passing through a drilled hole in the upper end of bolt 35. Washers 38 are provided at the upper and lower ends of sleeve 33. Pivot bolt 35 is provided with a head 39 welded to the top of a lift member 40 which is freely rotatable about the axis of sleeve 33. Lift 40 may be made of a single piece of heavy plate bent into a general C-shape rectilinear character with a flat top 41, a flat side or end 42 and a flat bottom 43 extending beyond the axis about which lift 40 rotates, such axis preferably passing through the middle portion of bottom 43. Lift 40 is open at the front and sides and preferably the internal dimensions thereof will accommodate modular packages of lumber L as illustrated in FIGURES 2 and 3, or other material of elongated nature. Such handling of a lumber package by attachment 20 is done by running the bottom 43 of lift 40 underneath the center of the material between the ends thereof so that upon lifting, the material will have sufficient flat support on bottom plate 43 to remain in a balanced condition. The internal height of lift member 40 is selected, preferably, so that should the material tend to tip, the top of such material would engage the edge of top plate 41 and hold it against shifting or falling. In some cases, attachment 20 may be used to lift material by the end as shown by a lumber bundle L' in the chain line position of attachment 20 in FIGURE 2.

In addition, the length of boom 22, which may also be a length of pipe or other structural strength shape, is

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selected preferably so as to enable the longest length of material normally encountered to clear the front of vehicle 10 in the course of a swinging action thereof about the axis of pivot 35 and lift 40. Normally, in lumber used for construction a maximum length of about twenty feet is encountered. Moreover, it will be noted that boom 22 in the course of its elevation and lowering by head 16 remains substantially horizontal. Further, boom 22 extends straight forward relative to vehicle 10 so that it is effectively counterbalanced in loaded or unloaded condition by vehicle 10. On the other hand, in equipment with lateral stability, corresponding pivotal movement may be provided for the rearward end of boom 22 adjacent its zone of connection to such equipment.

Whenever it is desired to return truck 10 to usage without attachment 20, the pins 28 can be pulled out of the holes 18, the set screws 25 can be slackened and the entire attachment 20 removed, simply and quickly. Conversely, attachment 20 can be rapidly and rigidly attached to truck 10 or other equipment when such is desired.

Further, my invention comprehends a loading system which will enable a regular box car 45 even such as a grain car with doorways 46 of standard width to be loaded, and unloaded, rapidly and with less manpower. Moreover, such may be done from one side of the car and modular bundles of lumber, or other material such as pipe bundles, stacked in close fitting regularly arranged piles at either or both ends of the car so that the lumber so piled will not readily shift and a minimum of bracing and blocking will be required. In the illustration shown in FIGURE 8, truck 10 and attachment 20 are "working" a standard car from the side indicated placing modular bundles L of relatively long lumber therein. The placement of such packages L of lumber in order in a pile at the end of the car shown begins on the bottom, or as close thereto as possible, and preferably against the side wall nearer to the vehicle 10. With a bundle L balanced in lift member 40, after having been taken from a yard or other place of storage or rest, it is carried to the side of the car and one end 47 pointed toward the doorway 46 by the turning of lift 40 about its pivot so that it can be moved into the car or other carrier along with lift member 40 as shown. When the other end 48 will clear the doorway, it then is swung into the dash-and-three-dot position shown, by further rotation of lift member 40. As illustrated, the bundle L in question is about to be deposited in the second stack from the rear side of the car. When parallel to such side, the end 48 is tipped upwardly to free the bottom plate 43 of lift member 40 which had been adjusted to approximately the level at which bundle L would assume upon being deposited in the car. Such tipping or tilting causes the end 47 (indicated as 47a) to rest on the floor of the car or bundle immediately therebeneath, as the case may be, whereupon shoving of bundle L toward car end 49 will put the bundle in place in the stack and such will continue until a full lumber pile as shown in end view in FIGURE 9 has been loaded. In the shoving of bundle L into its final place of deposit, rollers 50, which may be made of lengths of dowelling, may be placed under the bundle to facilitate such movement. In the position of vehicle 10 when at 10a, another modular package unit of lumber La is being "worked" to fit into the fourth column at whatever the lowest open row height exists in that column at the time the bundle La is inserted. When the lumber pile 51 is complete, it may be secured in position by wooden brace members 52 and 53 with blocks 54 used for smaller spaces, such bracing and blocks being nailed in position to one another and the walls of the car. In addition, when the loading is completed, the transverse space across the car 45 defined by the width and height of the doorways 46 may be cross braced to hold the nearer ends of the respective lumber piles during movement of a train to

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which car 45 is attached. In unloading, converse steps are employed when utilizing an attachment of this invention for expeditious and far less expensive removal thereof.

Various changes may be made in the attachment embodiment illustrated herein and loading and unloading steps in my load handling system may be somewhat varied without departing from the spirit of my invention or the scope of the appended claims.

I claim:

1. In a lumber handling attachment for a conventional fork lift truck, apparatus comprising, in combination, a flat connector frame having a pair of longitudinally spaced transversely extending bars, each bar having transversely spaced sleeve bands underneath forming enclosures open in a longitudinal direction and shaped to conform to the cross section of the fork lift portion of said truck, said enclosures to each side on said bars being in longitudinal registry, set screws extending through the bottoms of said respective enclosures to affix said frame to said fork lift portion, one of said bars and the enclosures thereof being vertically drilled in registry with an opening through said fork lift portion, a pin adapted to pass through each set of registering openings when said frame engages said fork lift portion to secure said frame against longitudinal movement relative to said fork lift portion, cable means to flexibly attach said pins to said frame, a boom rigidly fastened to the underside of said bars to project forwardly in alignment with said fork lift portion, said boom being more than twice the length of said connector frame, a vertical bearing sleeve fastened to the outer end of said boom, a C-shaped single bent plate lift member having a flat solid top, side and bottom in rectangular relation, said lift member being open on the front and sides and having said top thereof terminating at about the middle of said bottom, a pivot rigidly connected to said top and extending through said bearing sleeve, thrust bearing means connecting said lift member to said bearing sleeve and boom for rotatable relative movement therebetween about the axis of said pivot and bearing sleeve, whereby modular bundles of lumber may be received endwise or lengthwise in the recess of said lift member for ready handling in accordance with movements of said truck and said lift member.

2. In a load handling attachment for conventional fork lift equipment, apparatus comprising, in combination, a flat connector frame, having a plurality of longitudinally spaced transversely extending bars, each bar having transversely spaced opening extending in a longitudinal direction and shaped to receive said fork lift, means to affix said frame to said fork lift, one of said bars being vertically drilled in registry with an opening through said fork lift, a pin adapted to lock said frame and said fork lift to secure said frame against longitudinal movement relative to said fork lift, a boom rigidly fastened to said bars to project forwardly in alignment with said fork lift, said boom being more than twice the length of said connector frame, a C-shaped lift member having a substantially solid flat top and flat bottom, said lift member being open on the front and sides, a vertical pivot assembly fastened to the outer end of said boom and to said lift member about the axis of said pivot assembly, whereby modular bundles of lumber or other material may be received endwise or lengthwise in the recess of said lift member for ready handling in accordance with movements of said equipment and said lift member.

References Cited in the file of this patent

UNITED STATES PATENTS

2,068,825	Stevenson	Jan. 26, 1937
2,410,373	Westervelt	Oct. 29, 1946
2,873,873	Fowler	Feb. 17, 1959