

[54] **PULLING ATTACHMENT FOR FORK LIFT TRUCKS**

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[51] Int. Cl. **B66f 9/12**

[58] Field of Search 214/620, 621, 750, 350

[56] **References Cited**

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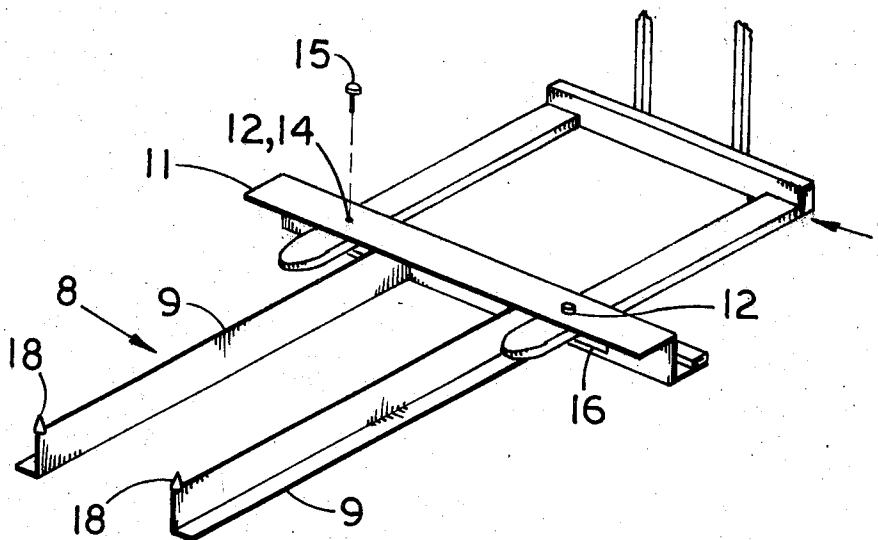
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[57] **ABSTRACT**

A means for handling material with a lift truck is disclosed wherein palletized loads can be reached and positioned for lifting on the forks by use of a probe having a pallet engaging point. The probe is mounted on the forks and extends to a position considerably in advance of the forks where it can engage a remotely located pallet. Once engaged by the probe, the pallet can be moved to a fork engaging position merely by applying a pulling force with the lift fork. The probe is of light weight (in fact too light to support a loaded pallet) construction so that the operator can readily attach and remove it from the fork.

5 Claims, 8 Drawing Figures



SHEET 1 OF 2

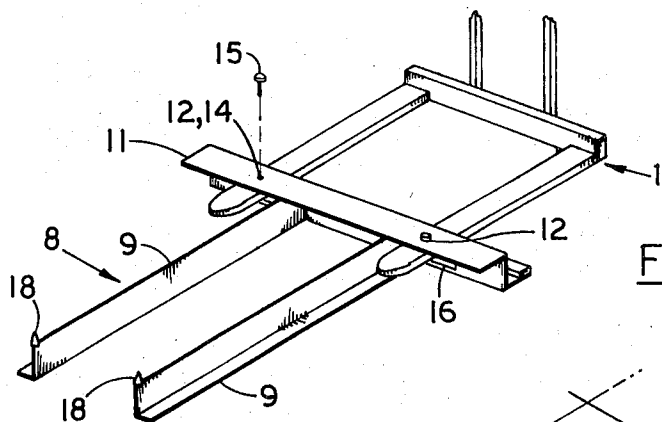


FIG. 1

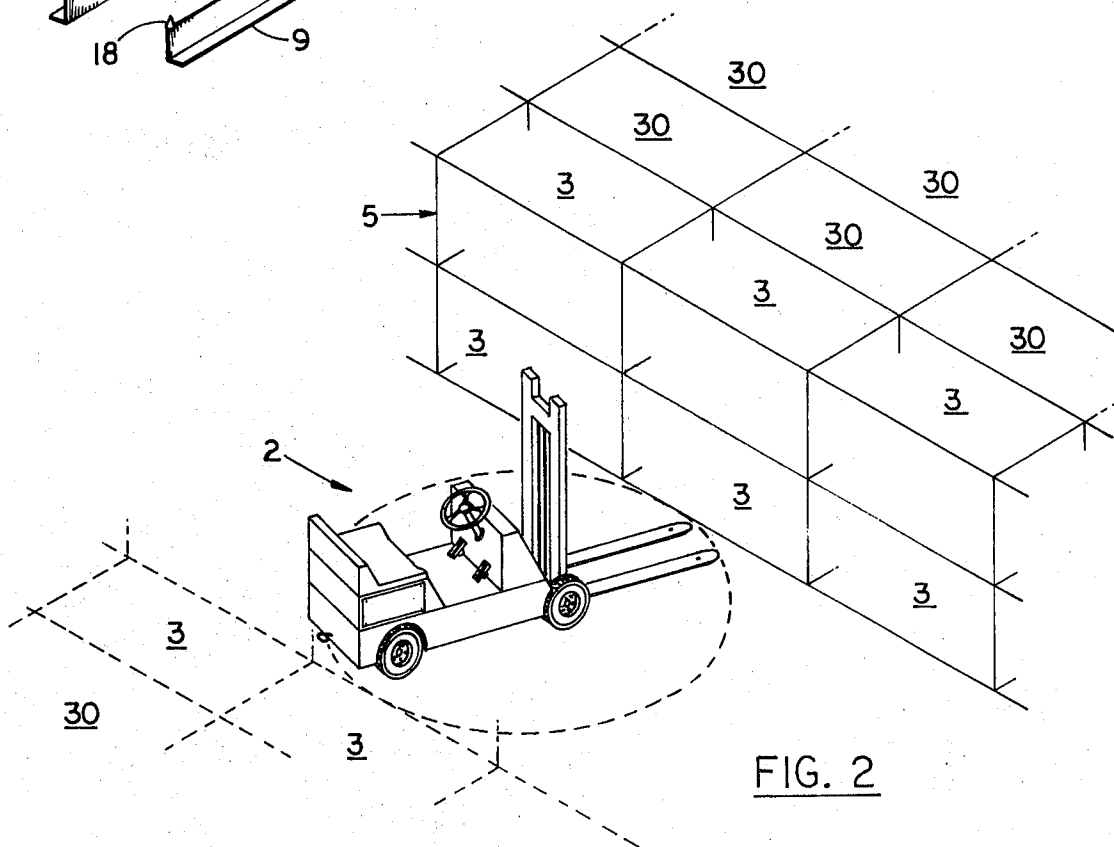


FIG. 2

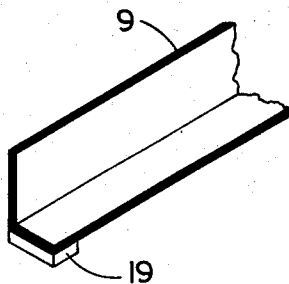


FIG. 4

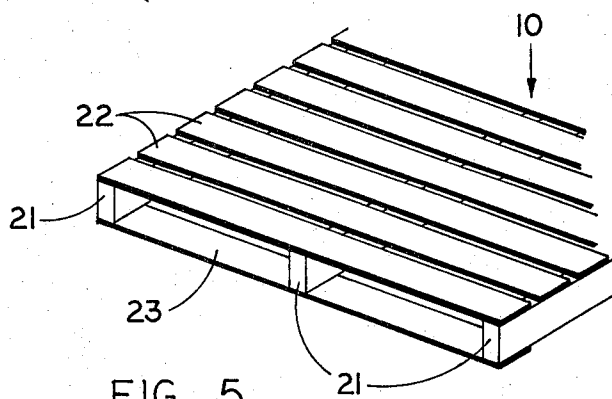


FIG. 5

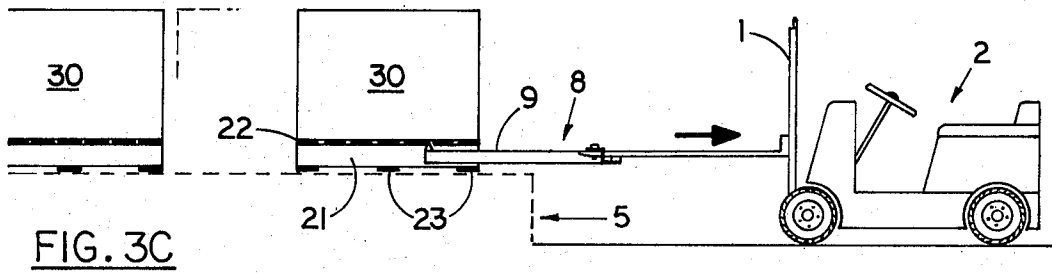
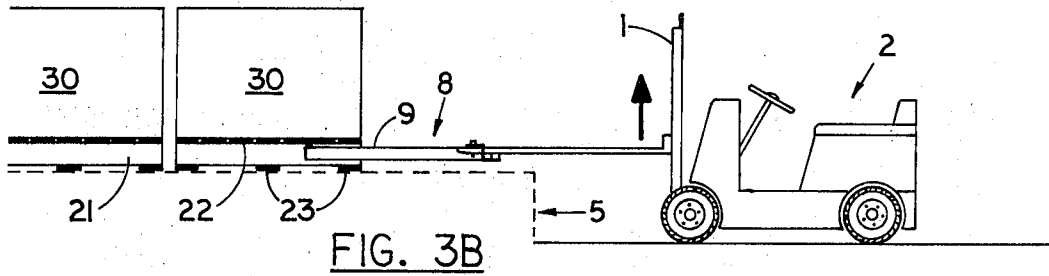
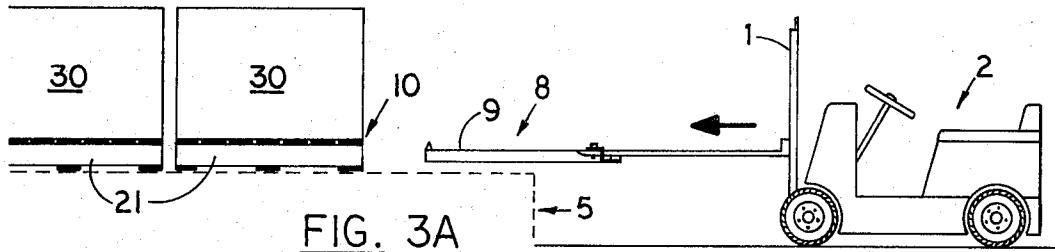


FIG. 3

PULLING ATTACHMENT FOR FORK LIFT TRUCKS

SUMMARY AND BACKGROUND OF INVENTION

The present invention relates to improvements in the art of handling material. One aspect of the invention relates to improvements and the art of handling material with a lift truck. An aspect of the invention is improvement in the method of so handling materials. One aspect of the invention is improvement in means in so handling materials. The invention is preferred for use with a lift truck in connection with removing loads from industrial shelving where the loads are remote (that is, beyond the reach of lift truck forks) from the trucks and/or forks in connection with which the invention will be described.

Modern warehousing methods for storing inventories of many kinds of industrial and other products have led to storage systems using palletized loads which are stored on racks or industrial shelving. Lift trucks are used to handle the palletized loads. The loads therefore have to be located on the shelving where the lift truck forks can engage same. This makes it difficult to store pallets one behind the other on such shelving because the rearmost or remote pallets are beyond the reaches of lift fork trucks. Moreover, if extra long forks are used, then extra wide aisle space must be employed which reduces the efficiency of space utilization.

The present invention has for one objective the enhancing of space utilization. It has for another objective the employment of an extension or probe which is attached to normal length forks to enable moving remote pallets to a position where lift truck forks of normal length can engage and remove same in conventional fashion.

As further described below, the probe consists of a webbed and flanged base member (e.g. a Z section) to which two non-load-bearing projections have been affixed as by welding. These projections are the extensions and have a generally vertical but small point for engaging a pallet. Two cutouts are provided in the base member to receive pins for holding same in position. In the method: the truck is first positioned with the forks aiming at a remote pallet. The operator dismounts, affixes the probe, and then moves the lift truck forward until the projections enter the pallet. The forks are then lifted or raised in a direction suitable for engaging the points on the probe with the pallet. Once engaged, the truck is backed away thereby applying a pulling force to the pallet by means of the probe and thus moving the pallet to a position close to the rack edge. The operator then stops the truck, dismounts, removes the probe and then picks up the load in conventional fashion with the lift truck forks and removes it to wherever it is desired.

Advantages realized by the present invention are the use of narrower aisles and better space utilization. Other advantages and features may be appreciated from a reading of the following disclosure in connection with the annexed claims and drawings:

FIG. 1 isometrically shows an assembled probe in position on a conventional pair of lift truck forks;

FIG. 2 schematically isometrically shows the arrangement of palletized loads on shelves;

FIG. 3 including FIG. 3A, FIG. 3B and FIG. 3C, shows schematically a series of steps in a method according to the present invention;

FIG. 4 isometrically illustrates a modified portion of the probe of FIG. 1; and

FIG. 5 illustrates schematically a typical pallet.

There is shown a pair of conventional lift truck forks 1 mounted on a lift truck 2 (shown partially in FIGS. 2 and 3). The pair of forks extends forwardly and can be raised and lowered vertically on the lift truck column. The forks are spaced apart an amount suitable for insertion in the open spaces of pallets. The pallets with which we are here concerned are preferably made of wood although they may be made of other materials; e.g. plastic materials, metals and the like.

Palletized loads 3 consisting of a pallet and a load resting thereon (often strapped thereon) are shown in FIGS. 2 and 3.

The invention is concerned with helping the lift truck reach a palletized load (located on shelves 5 or sometimes on the ground) remote from the forks, too far away to get a satisfactory lifting engagement, or for that matter an engagement of any other sort. Such remote loads are designated 30.

The present invention accomplishes this by a welded steel probe assembly 8 with fork extensions 9 which are used to apply a pulling force to the pallet 10 of the palletized load 3. By pallet I refer to both empty and loaded pallets although in the normal circumstance the storage problems encountered here will have a pallet that is fully or partially loaded, not empty. Empty pallets would ordinarily have been removed from the shelving.

The probe 8 (FIG. 1) comprises the base member 11 which is preferably made with a Z cross section. A pair of holes 12, are drilled in the upper flange of the Z in order to register with holes 14 in the respective forks. Pins 15 are used to drop through the holes when they are registered whereby to secure the probe sufficiently for carrying out the material handling and procedures desired.

The web of the base member 11 has a pair of the spaced apart holes 16 therein which are in register with the aforesaid flange holes. The holes 16 are for receiving the forks 1 therein. In this fashion, the probe 8 can be slipped over the forks, the pins 15 dropped in place by the operator, and the probes then quickly engaged with the pallet 3 and used to pull it to the position of FIG. 3 C.

The base member 11 has welded thereto the pair of fork extensions 9 which preferably are made out of angle iron but may also be made of an I or H section member. At the outermost end of these extensions are welded points 18. The points may comprise a mass built up by welding which has been ground or sharpened. They may also as in FIG. 4, comprise a rectangular piece of material 19 welded on the bottom of angle iron 9 to engage the bottom slats 23 on a pallet.

The pallet 10 (FIG. 5) should preferably be made of conventional wood construction with three 2 inches x 4 inches stringers 21 with a wooden deck of slats 22 and either a bottom deck or three slats 23.

In operation the process of handling materials (FIGS. 2, 3) involves first the positioning of the lift truck 2 within an aisle between shelving 5 with the forks aimed at a pallet 30 (FIG. 2) in the second row. Pallet 30 is the same as any palletized load 3 but number 30 is used

for identification of the remote load to be handled. The operator dismounts from the lift truck and affixes the probe 8 to the fork using the pins 15. The system is then arranged like FIG. 3 A. He then resumes the driver's seat, advances the lift truck forwardly to insert the probe into the pallet either to where the point 18 (shown) or 19 (FIG. 4) can engage either a web slat 21 or a slot between slats 23 (FIG. 3 B). The forks should be moved vertically up in order to engage the points 18 with the pallet in the manner just described, or alternatively using the FIG. 4 probe, moved vertically down to a position where point 19 is in said slot.

Once the pallet is engaged by a point, the truck is backed away (FIG. 3 C) from the rack thereby applying a pulling force to the pallet by means of the probe and particularly through the probe extensions. This of course causes the pallet to be dragged across the rack 5 by means of the probe. When the pallet has been dragged far enough forward so that it can be engaged by again vertically moving the forks in the opposite direction from before to cause disengagement (down if points 18, up if points 19), removing the probe and then inserting the forks into the pallet and moving same.

The probe is attached to the forks manually by the lift truck operator or an assistant who slips the forks through the holes 16 and secures the probe 8 to the forks using pins 15.

Using the above invention greatly increases the efficiency of warehousing. For instance, if a 10 foot aisle is provided for a lift truck, normally a rack (i.e., shelf 5) suitable for only one row of pallets 3 each 4 feet wide and 4 feet long would be provided on each side for a space utilization of $(4 + 4) \div (4 + 4 + 10)$, or 8 out of 18 feet, or 44.5 percent. The present invention allows using at least twice as many racks on each side (FIG. 2) for service for the same truck thus raising space utilization to 16 out of 26 feet or 61.7 percent.

The invention claimed is:

1. An article of manufacture for use on a lift truck to apply pulling forces to pallets and similar loads thereby positioning them for further material handling activities comprising a lightweight, manually manipulable attachment defined by
flanged base member having a vertical web portion,

an upper horizontal flange extending forwardly from the upper edge of said vertical web and a lower horizontal flange extending rearwardly from the lower edge of said vertical web;

a pair of holes in said web portion spaced apart a distance and being of a size sufficient to receive the forks of a conventional fork lift truck;

a second pair of holes in the upper horizontal flange of said base member laterally spaced so as to register with said first pair of holes to receive locking pins to removably connect said base member to said forks;

a pair of co-planar and parallel probe extensions secured at one end to said base member and extending therefrom in cantilever fashion forwardly of said forks, each of said probe extensions being defined by an L-shaped angle having horizontal and vertical legs, said horizontal legs being co-planar and disposed below the extreme ends of the forks of said fork lift truck, the vertical legs being spaced so as to fit between the forks of said lift truck;

a sharpened projection at the outermost end of each probe extending vertically therefrom;

whereby said base member upon being connected to the extreme ends of said forks and locked by said locking pins will support said probes in a substantially horizontal position extending forwardly and outwardly of said forks thereby to be in a position to engage and apply only horizontal pulling forces to pallets and similar loads.

2. An article according to claim 1 wherein said probe point is of a sharpness sufficient to penetrate wooden portions of the pallet thereby to engage in and wherein each of said extensions is sufficiently strong enough to withstand the vertical loads applied to cause such penetration but are not strong enough to support a loaded pallet.

3. An article according to claim 2 wherein each said probe point extends upwardly from the probe.

4. An article according to claim 1 wherein each said probe point extends downwardly from the probe.

5. An article according to claim 1 wherein each said probe point extends upwardly from the probe.

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