

[54] **SIDE LOADING DEVICE FOR FORK LIFT TRUCKS**

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[51] Int. Cl. **B66f 9/06**

[58] Field of Search **214/620, 730, 731, 750, 214/652, 671; 187/9**

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[57]

ABSTRACT

The invention relates to a side loading fork lift device adapted to be used with fork lifts of a fork lift truck. The device comprises a pair of parallel fork lifts extending forwardly from a swing arm assembly which can rotate on a platform to the left or right. The platform comprises a pair of parallel sleeves adapted to engage the fork lifts of a truck. The device comprises several safety features such as means to secure the device to the truck, means to secure the swing arm in a rotated position, leg stands on the device, and heels on the fork lifts for preventing any sliding of a load thereon.

1 Claim, 10 Drawing Figures

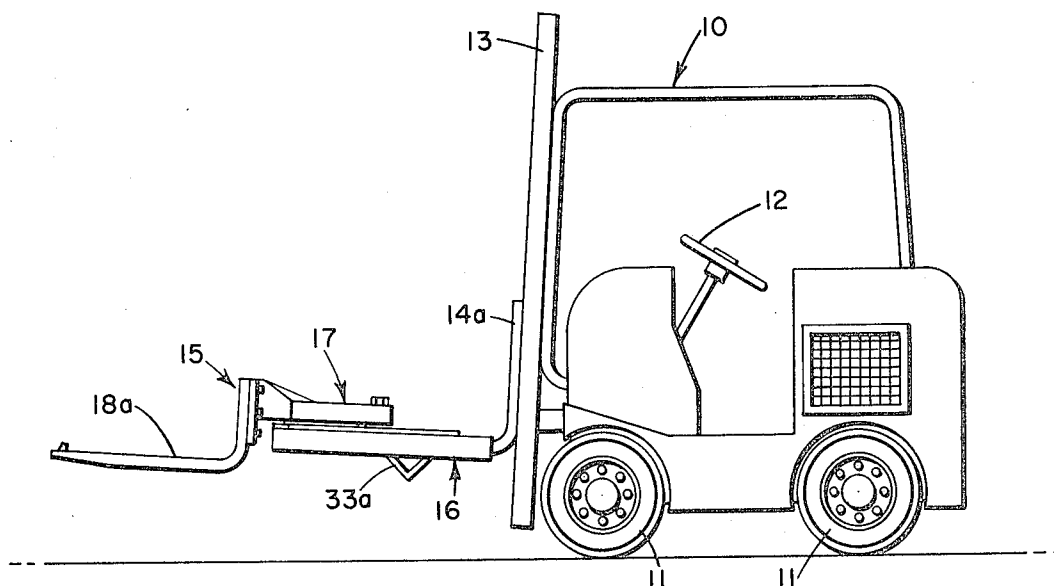


FIG. 1

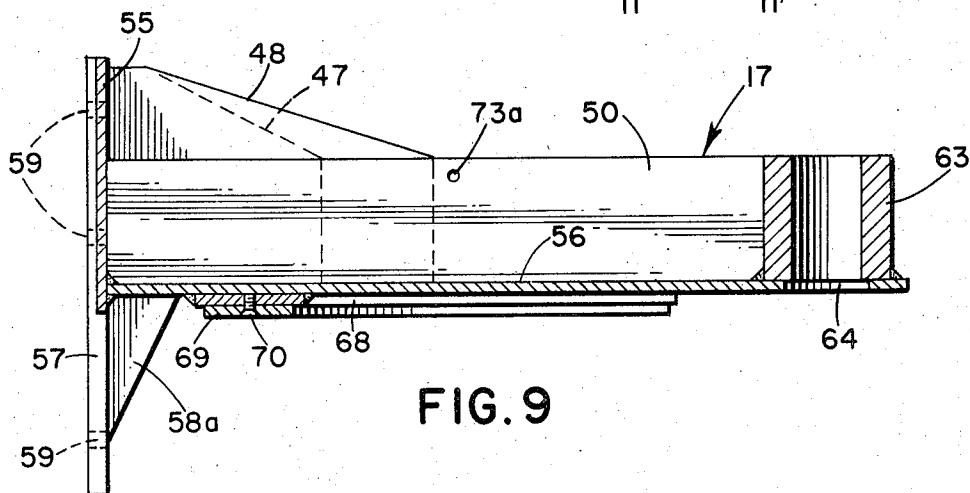
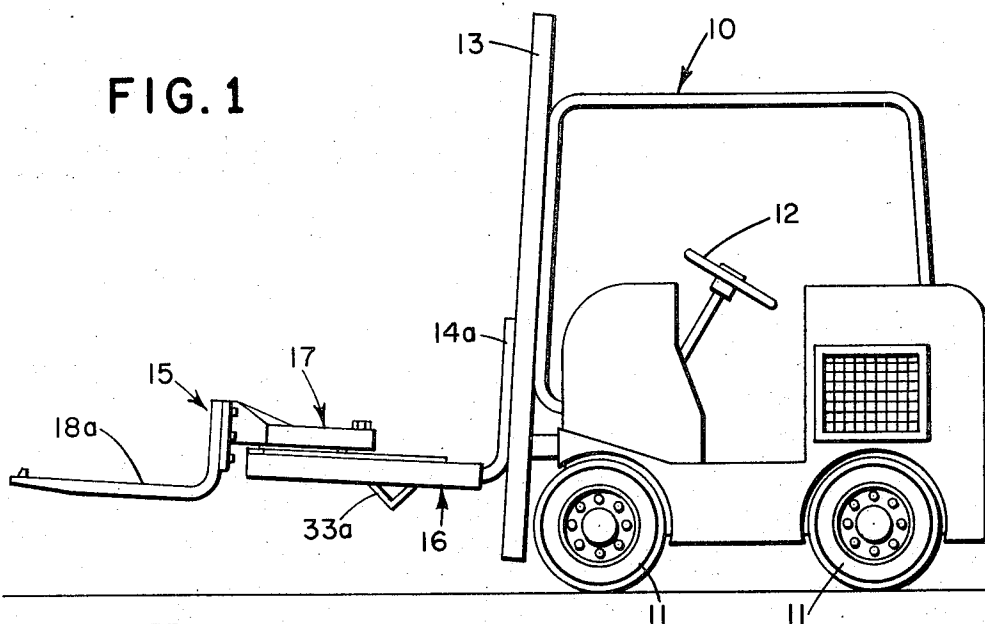


FIG. 9

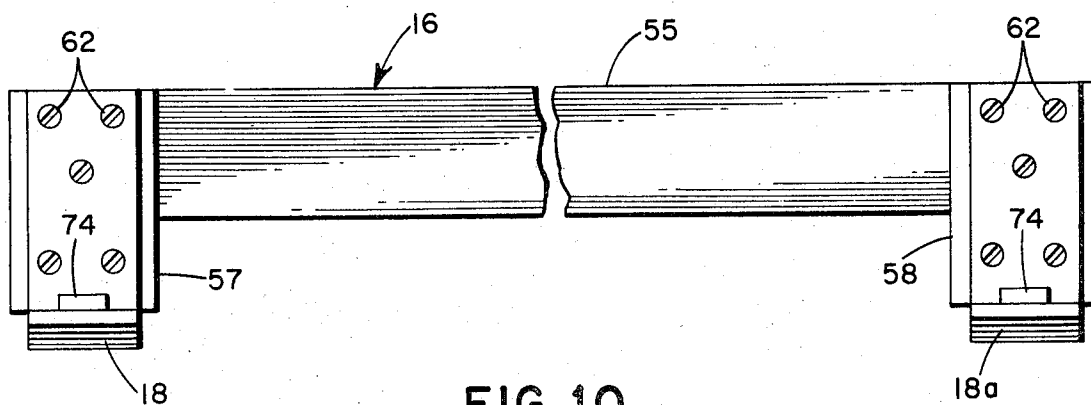
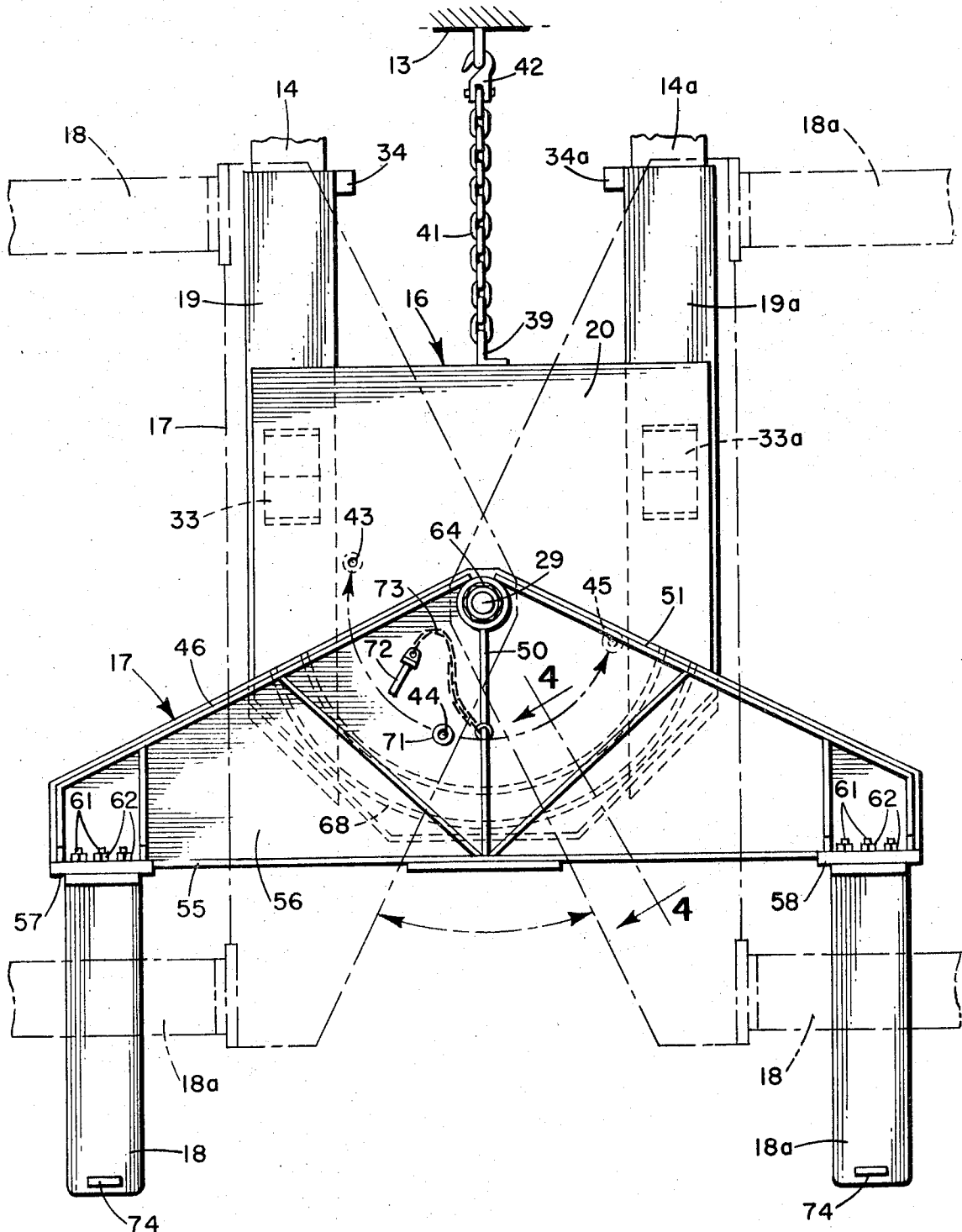


FIG. 10

FIG. 2



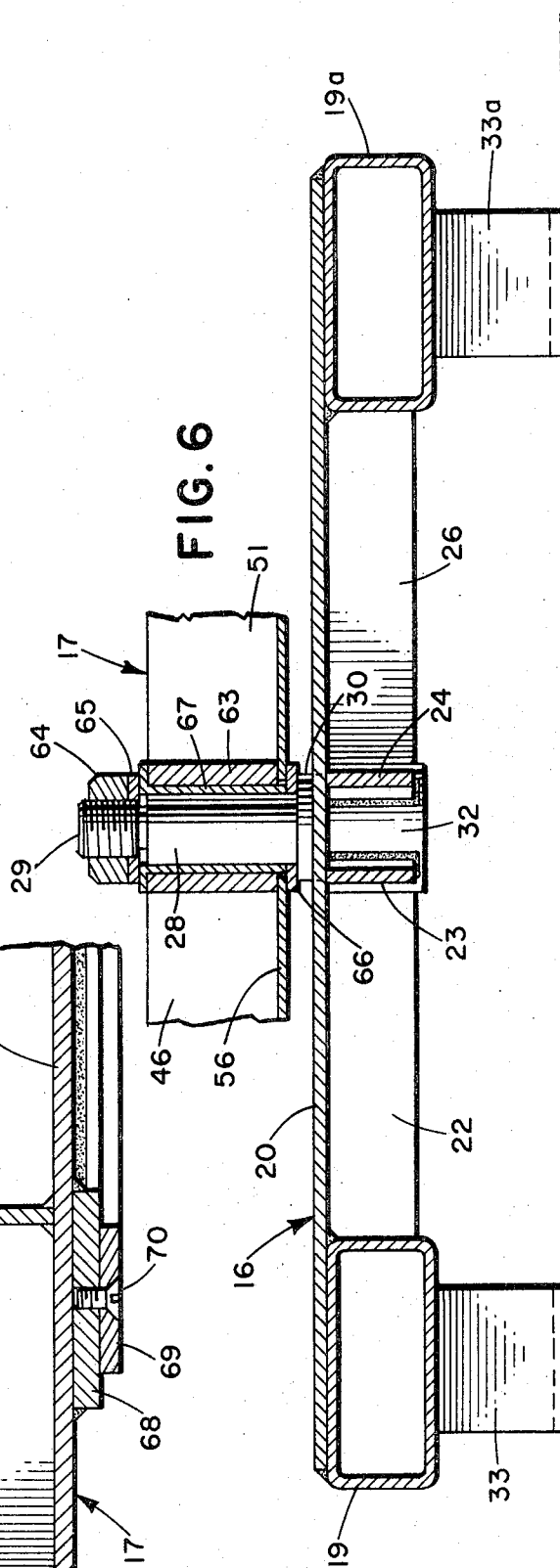
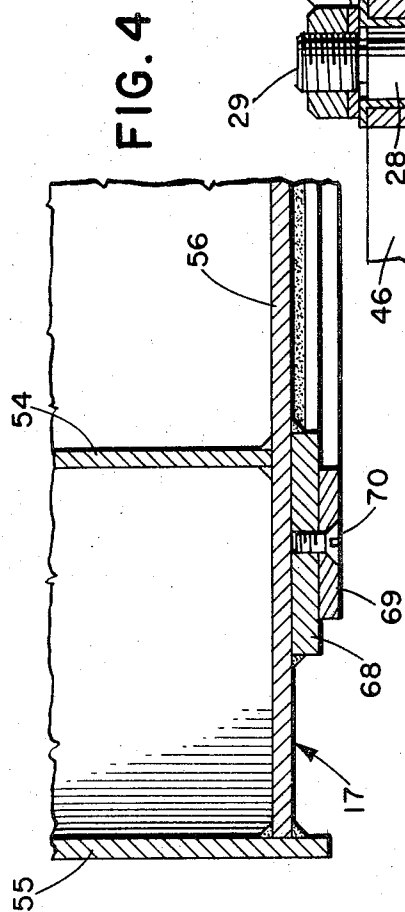
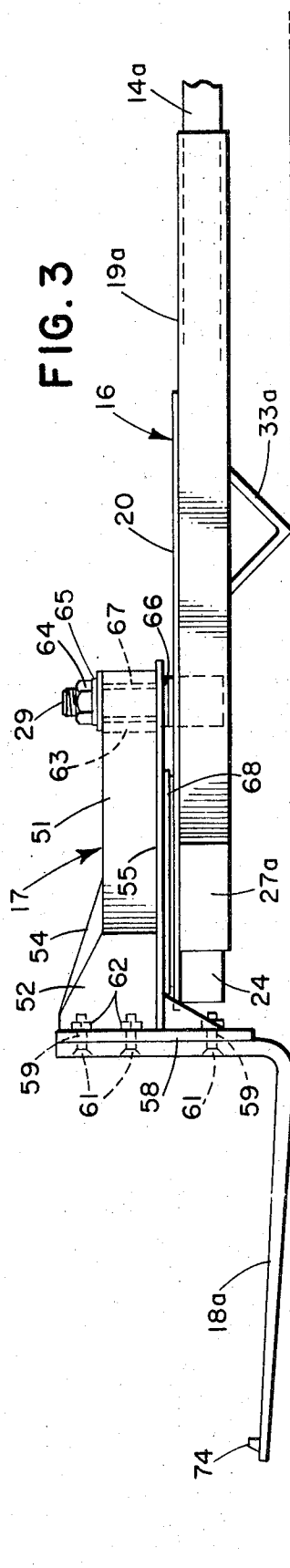


FIG. 5

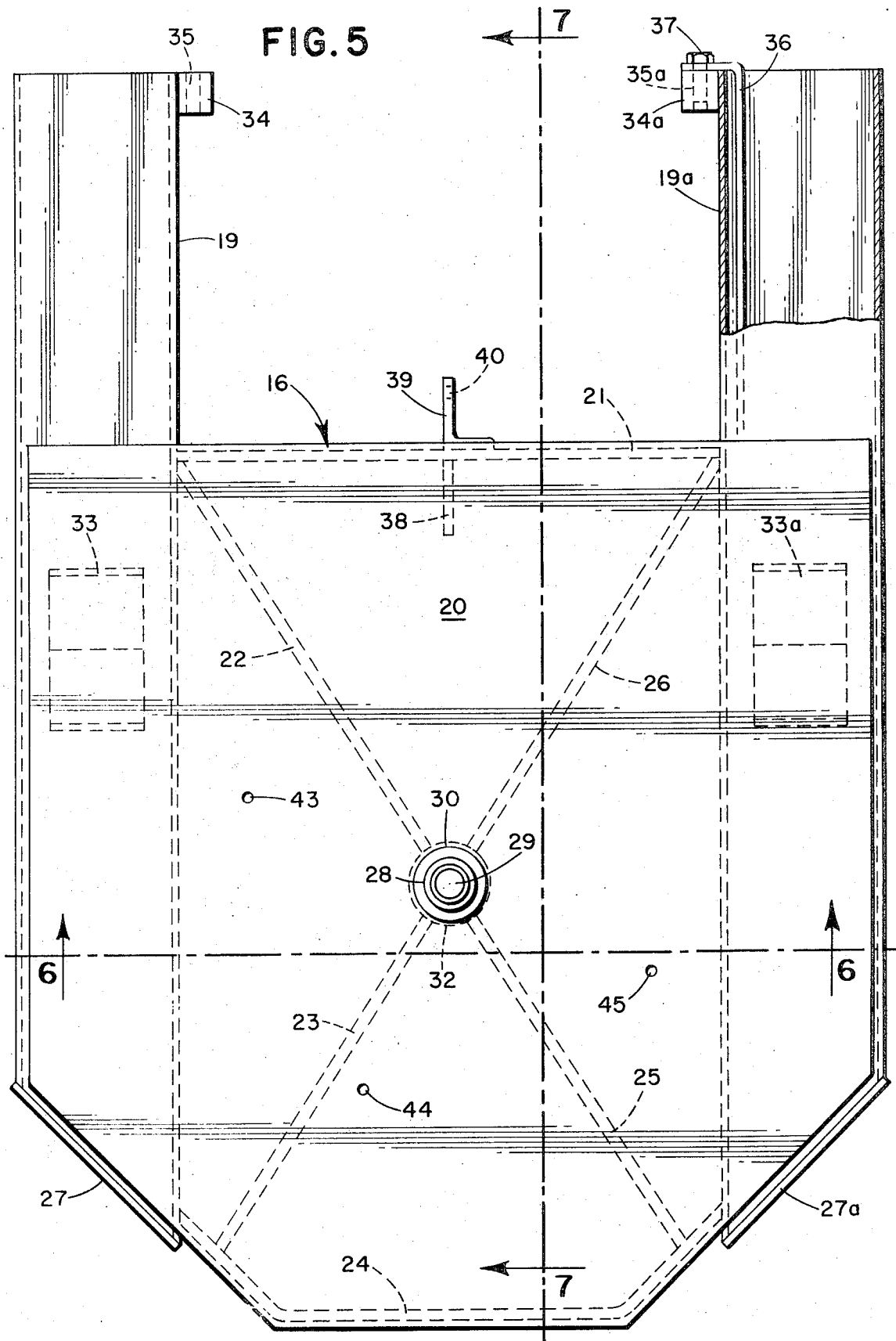


FIG. 7

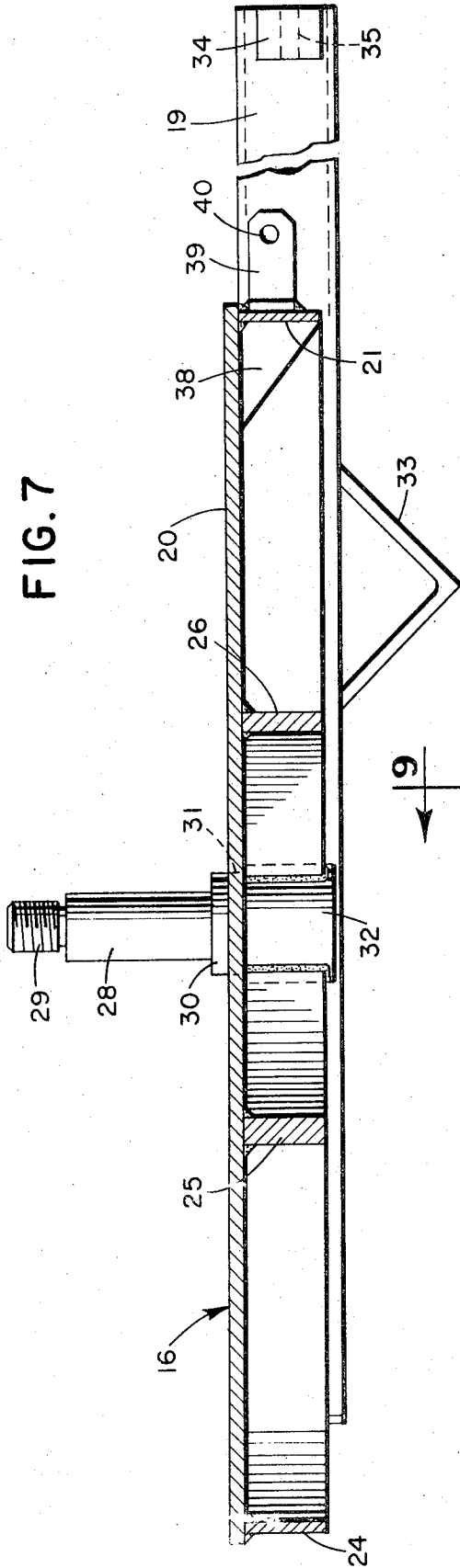
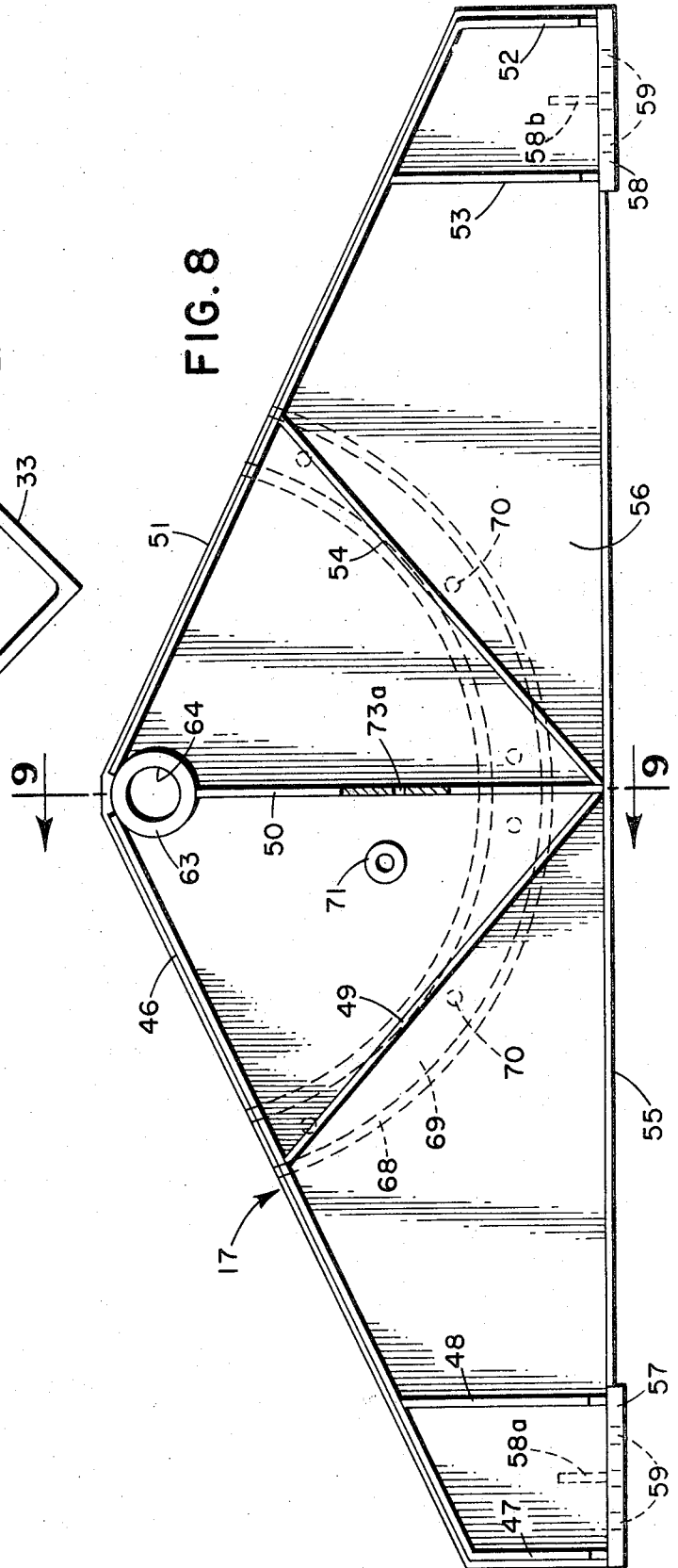


FIG. 8



SIDE LOADING DEVICE FOR FORK LIFT TRUCKS

BACKGROUND OF THE INVENTION

This invention relates to a side-loading device usable with fork lift trucks whereby side loading and unloading is possible in narrow aisles.

Industrial vehicles are used for conveying pallet loads and the like from a platform or siding to a storage area and vice versa. The most commonly used vehicle is a fork lift truck since loads can be loaded or unloaded at differing heights on top of each other. However, the use of fork lift trucks in narrow aisles of storage areas present problems in maneuvering, since it is difficult to turn the truck so that the load can be discharged to the right or left of the narrow aisle.

Various devices have been proposed for solving the problem. Usually, the fork lift trucks are modified by mechanically or electrically operated means whereby the forks can be turned to the left or right in a narrow aisle. However, these modifications comprise complicated elements which add materially to the cost of the fork lift truck.

SUMMARY OF THE INVENTION

An object of this invention is to provide a side loading device, simple in design, economical, and easy to construct, which is capable of being easily attached to the fork lifts of a conventional fork lift truck.

Another object of this invention is to provide a side loading device having a pair of parallel fork lifts, which are capable of being manually turned to the left or right in a narrow aisle.

Another object of this invention is to provide a side loading device being provided with safety features adapted to prevent accidents in loading or unloading loads in a narrow aisle.

Other objects, advantages and features of the side loading device will become apparent from the following description and drawings of a complete embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

In the drawings:

FIG. 1 is a side elevation view of the side loading device of the invention illustrating its use mounted on a fork lift truck;

FIG. 2 is a top plan view of the side loading device;

FIG. 3 is a side elevational view of the side loading device;

FIG. 4 is a section taken along line 4—4 of FIG. 2;

FIG. 5 is a top view of the platform and sleeves forming a part of the side loading device;

FIG. 6 is a section taken along line 6—6 of FIG. 4;

FIG. 7 is a section taken along line 7—7 of FIG. 4;

FIG. 8 is a top view of the swing arm forming a part of the side loading device;

FIG. 9 is a section taken along line 9—9 of FIG. 8; and

FIG. 10 is a front elevational view of the swing arm with the fork lifts attached.

Referring to the drawings, the numeral 10 generally indicates a fork lift truck of the counterbalance type

comprising baloon wheels 11, steering mechanism 12, a vertical mast structure 13 of any suitable character adapted to be traversed vertically by a pair of forwardly extending fork lifts 14 and 14a by means of a conventional hydraulic system and controls (not shown). The fork lifts are adapted to engage a loaded pallet or the like for transport thereof from place to place.

It will be apparent that a disadvantage inherent in simple fork lift trucks is the fact that the load may be loaded and unloaded only from the forward direction of the truck. Accordingly, loading and unloading operations of the loaded truck within narrow aisles of storage areas is difficult.

The numeral 15 generally denotes the side loading device of this invention which is adapted to engage forks 14 and 14a of the fork lift truck. The device comprises a sleeve platform structure generally designated by the numeral 16, a swing arm generally designated by the numeral 17, and L-shaped forks 18 and 18a secured thereto. The swing arm is adapted to rotate on the platform as will be described hereinafter.

The platform structure 16 comprises a pair of parallel hollow sleeves 19 and 19a, adapted to receive and engage forks 14 and 14a of the truck, and a top plate member 20 connected across the tops of the sleeves as by welding. Brace bars 21, 22, 23, 24, 25, and 26 are welded to the plate 20 and bars 21, 22, 24, and 26 are also welded to the sleeves. Bars 23 and 25 are also welded to bar 24. Sleeves 19 and 19a can also be provided with caps 27 and 27a to cover their open ends.

At the midsection of plate 20, there is provided an upstanding shaft upon which the swing arm 17 can rotate. The unitary shaft has four sections of different diameters, i.e., a threaded section 29, a section 28 on which the swing arm can rotate, a section 30 extending through a hole 31 in plate 20 to which the shaft is welded, and a section 32 extending below plate 20 and also welded thereto from the underside. Brace bars 22, 23, 25, and 26 are also welded to section 32 of the shaft.

The plate 20, sleeves 19 and 19a, brace bars 21, 22, 23, 24, 25, 26, and the shaft being all welded together result in a rigid unitary platform structure capable of providing adequate structural support for the swing arm 17 and loads carried thereon. Additional strength is also provided by gussets such as at 38.

The platform structure 16 is also provided with leg stands 33 and 33a mounted to the undersides of sleeves 19 and 19a. The leg stands can contact the ground when the side loading device is loaded on a truck and when it is not being transported, thereby holding the load level and providing an additional safety measure.

Sleeves 19 and 19a have a fixed width adapted to accommodate the widest forks provided with fork lift trucks. However, difficulties are encountered in using the side loading device with forks having narrower widths. Accordingly, the sleeves are provided with means to accommodate narrower forks. Blocks 34 and 34a are welded to the sections of the sleeves 19 and 19a. The blocks are provided with threaded holes 35 and 35a. As shown in FIG. 5 only with sleeve 19a, a spacer bar 36 is adapted to be easily fitted within sleeve 19a and secured to block 34a by means of screw 37. Similarly, a spacer bar can be inserted in sleeve 19. The

spacer bars can be of different widths to accommodate corresponding widths of the forks of fork lift trucks.

Platform 16 is also provided with an angle member 39 with an eyelet 40. A chain 41 containing a grab hook 42 is attached to the eyelet. The grab hook 42 can be hooked to any part of the fork lift truck, e.g., the mast 13 to secure the side loading device to the forks 14 and 14a of the truck as an added safety feature.

Holes 43, 44, and 45 are provided through plate 20 and their function will become apparent hereinafter.

The swing arm 17 is adapted to engage section 28 of the shaft of platform 16 and rotate horizontally through an arc of at least 180°. The swing arm comprises a framework of vertical structural members 46, 47, 48, 49, 50, 51, 52, 53, 54, and 55 welded to horizontal plate 56. Vertical plates 57 and 58 are welded at each front side of the swing arm and are further secured with gussets 58a and 58b. Plates 57 and 58 are each provided with a plurality of holes 59 which match a similar plurality of holes in fork lifts 18 and 18a. Each of the fork lifts is secured to the respective plate by means of nuts 61 and bolts 62.

A hub 63, aligned with hole 64 in plate 55, is welded to plate 55 and also the structural members 46, 50, and 51. Hub 63 is adapted to engage section 28 of the shaft of platform 16 as shown in FIGS. 2 and 3. A bolt 64 threaded on section 29 of the shaft, thrust bushings 65 and 66, and bushing 67 secure the hub to the shaft and allows rotation of the hub and the swing arm on the shaft.

Plate 55 of the swing arm is provided on the underneath side with a circular bearing pad shim 68 (FIG. 4) to which a replaceable, circular, bearing pad 69 is secured by means of flat head cap screws 70 (FIG. 4). The swing arm 17 can rotate to the left or right of the platform 16 as bearing pad 69 traverses a circular path on the surface of plate 20. The circular path traversed on plate 20 is maintained free of obstructions and can be suitably treated to reduce frictional wear on the bearing pad.

To provide further safety in the handling of loads with the side loading device, means are provided to secure the swing arm in the left, right, forward or intermediate position. Holes 43, 44, and 45 in plate 20 are adapted to line up with a retaining pin hole and collar 71 in plate 56 of the swing arm. Thus, when the swing arm is in the extreme position to the left (i.e., 90° to the left) in FIG. 1, it can be secured in that position by inserting a retaining pin 72 through holes 71 and 43. Similarly, the swing arm can be secured in a forward position (as shown) with holes 71 and 44, and in an extreme right position (90° to the right) with holes 71 and 45. The retaining pin 72 is secured to the swing arm by a chain 73 suitably attached to hole 73a in structural member 50.

The fork lifts 18 and 18a, being removable can be interchanged with various lengths of forks are desired. A further safety aspect of the forks is present by providing heels 74 near the end of each fork. The heels retain the loads on the forks and prevent possibly sliding of the load from the forks.

The simplicity of the side loading device makes the operation thereof simple while at the same time reliably and durably. When it is desired to use a fork lift truck in narrow aisles and the like, one needs only to engage the device to truck forks 14 and 14a by means of

sleeves 19 and 19a. In the event, the truck forks 14 and 14a are narrower than desired for use with the sleeves of the device, the spacer bars 36 can be inserted in the sleeves to provide a more snug engagement with the narrower forks. The device is further secured to the truck forks by attaching grab hook 42 to the mast of the truck.

The device is at once ready for use and when it is desired to pick up a load in a narrow aisle, one needs only to manually turn the swing arm 17 to any angle necessary to engage or discharge a pallet load or the like with forks 33 and 33a. When the swing arm is at the desired angle (e.g., in the extreme right position) the retaining pin 72 may be inserted to secure the swing arm and thereby facilitate movement of the load for storage.

The securing of the swing arm by pin 72 is especially advantageous when transporting loads from one station to another, whereby the swing arm is prevented from movement in its circular path while the truck is moving.

Since the swing arm may be rotated at least 180°, one can pick up or discharge loads to the right or left of the truck. The rear wheels of the truck are normally turned by the steering wheel. Thus, maneuvering of the load in and out of storage is simplified since the load is self-aligning. Thus, in order to deposit a load in a storage area to the right of a narrow aisle, one would turn the swing arm 17 to align it with the space into which the load is to be deposited. Thereafter, the load is guided into the area by jockeying the truck forwardly and backwardly while turning the rear wheels, whereby the truck is eventually turned towards the area in which the load is to be deposited. To pick up a load out of storage, the procedure is reversed.

It is also understood that the truck may load or unload forwardly of the truck in the usual manner when employing the device. Another apparent advantage of the device is in facilitating a loaded truck to negotiate turns from one narrow aisle to another.

While a specific embodiment of the invention has been described, it is to be understood that the invention is not limited to the specific features shown and various changes may be made in its construction.

What is claimed is:

1. A side loading fork lift device adapted for use with permanently forward extending fork lifts of a fork lift truck and the like comprising:

- a. a pair of horizontal, parallel fork receiving members and plate means secured between and across the tops of said receiving members to form a platform;
- b. rigid shaft means centrally disposed vertically on said platform;
- c. a rotatable swing arm assembly including horizontal plate means disposed on said platform forwardly of said shaft means, and comprising hub means adapted to securely engage and to rotate at least 180° on said shaft means;
- d. an arcuate bearing surface disposed on the underside of said swing arm plate means adapted to contact the surface of said platform and move thereon in an arcuate path;
- e. a pair of parallel fork means mounted on and disposed forwardly of said rotatable swing arm assembly;
- f. chain and hook means secured to the rear of said platform and detachably securable to said truck,

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whereby said device is retained on said fork lifts of said truck;

- g. said fork receiving members including means adapted to detachably secure spacer means within said receiving members, whereby forks of a truck narrower than said receiving members can be received and snugly retained;
- h. a circular series of holes in said platform each adapted to match with a hole in said swing arm plate means, retaining pin means on said swing arm

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assembly adapted to be placed through matched hole means and thereby retain said swing arm assembly in a desired position on said platform;

- i. heel means disposed within the extremities of said parallel fork receiving members to assist in retaining loads therein;
- j. leg stands disposed on the undersides of said fork receiving members.

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