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GB 2231026 A **GB 0892494 A** **WO 82/04241 A1**
DE 002033504 A

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(54) **A portable hydraulic forklift attachment for a pallet truck**

(57) An attachment that can be lined onto a pallet truck so as to be capable of tilting a loaded pallet to a far greater height than before (See figure 10).

This device will be adjustable so as to fit any dimensions of pallet truck and will consist of a mild steel frame with two channelled uprights, 9, to which will be fitted a single hydraulic cylinder, 23. This cylinder will be linked to a vertically sliding section, 18, onto which the forks, 34, are attached. These forks, 34, will be able to slide horizontal so that different fork spacing can be achieved, as the forks, 34, must lie over the pallet trucks forks, 5.

To prevent the attachment and pallet truck from becoming unsteady and rocking from side to side, a pair of stabilisers, 30, will be attached, one at either end of the base plate, 7.

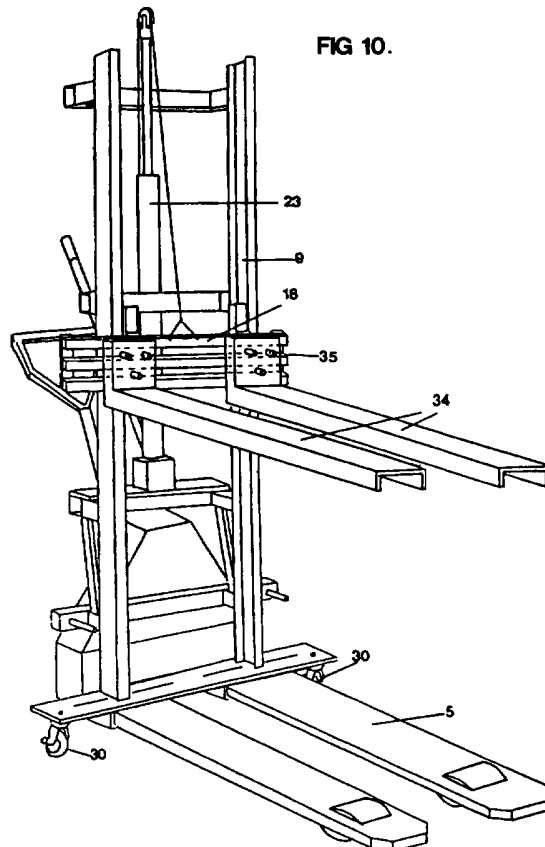
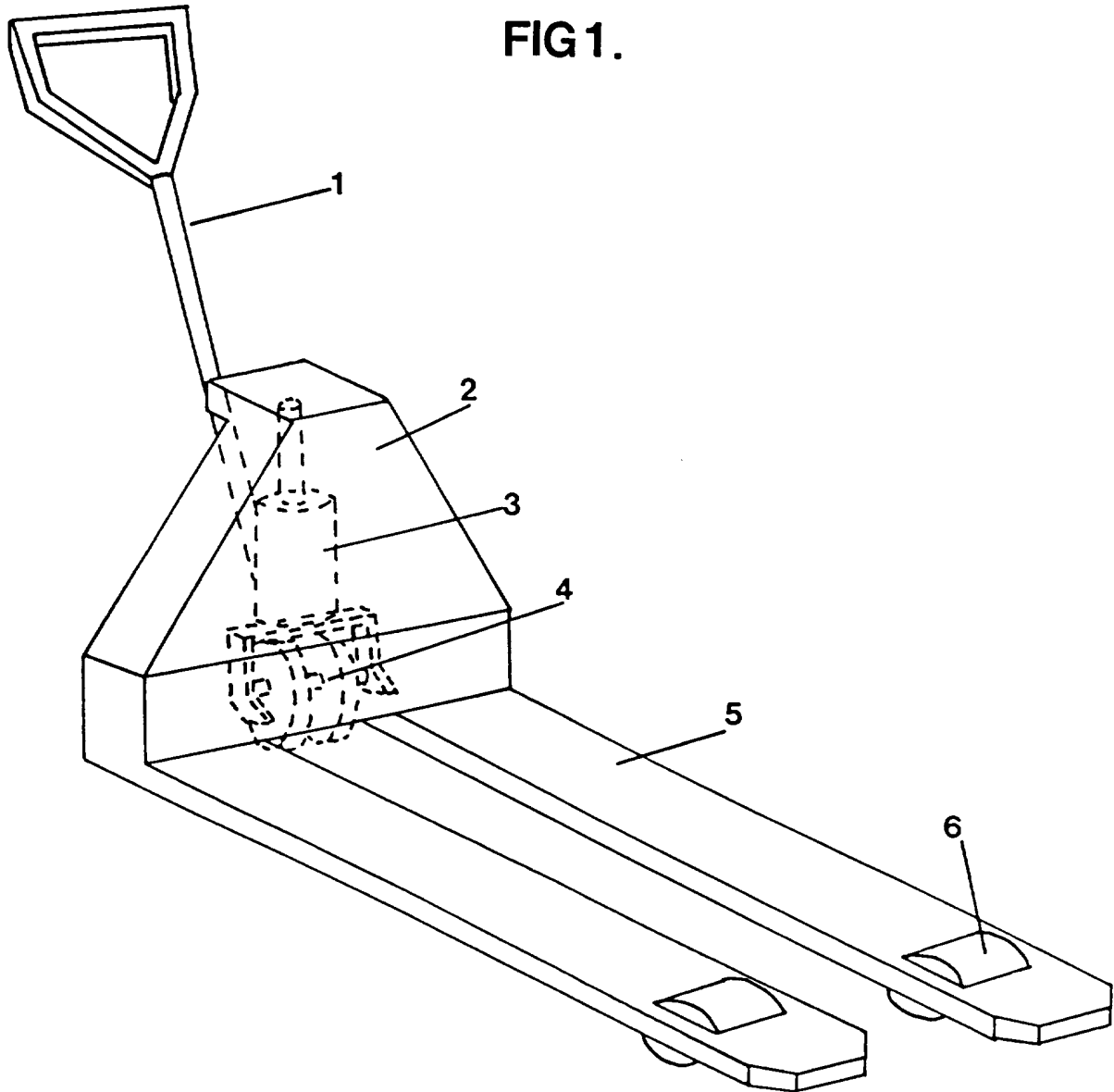


FIG 10.

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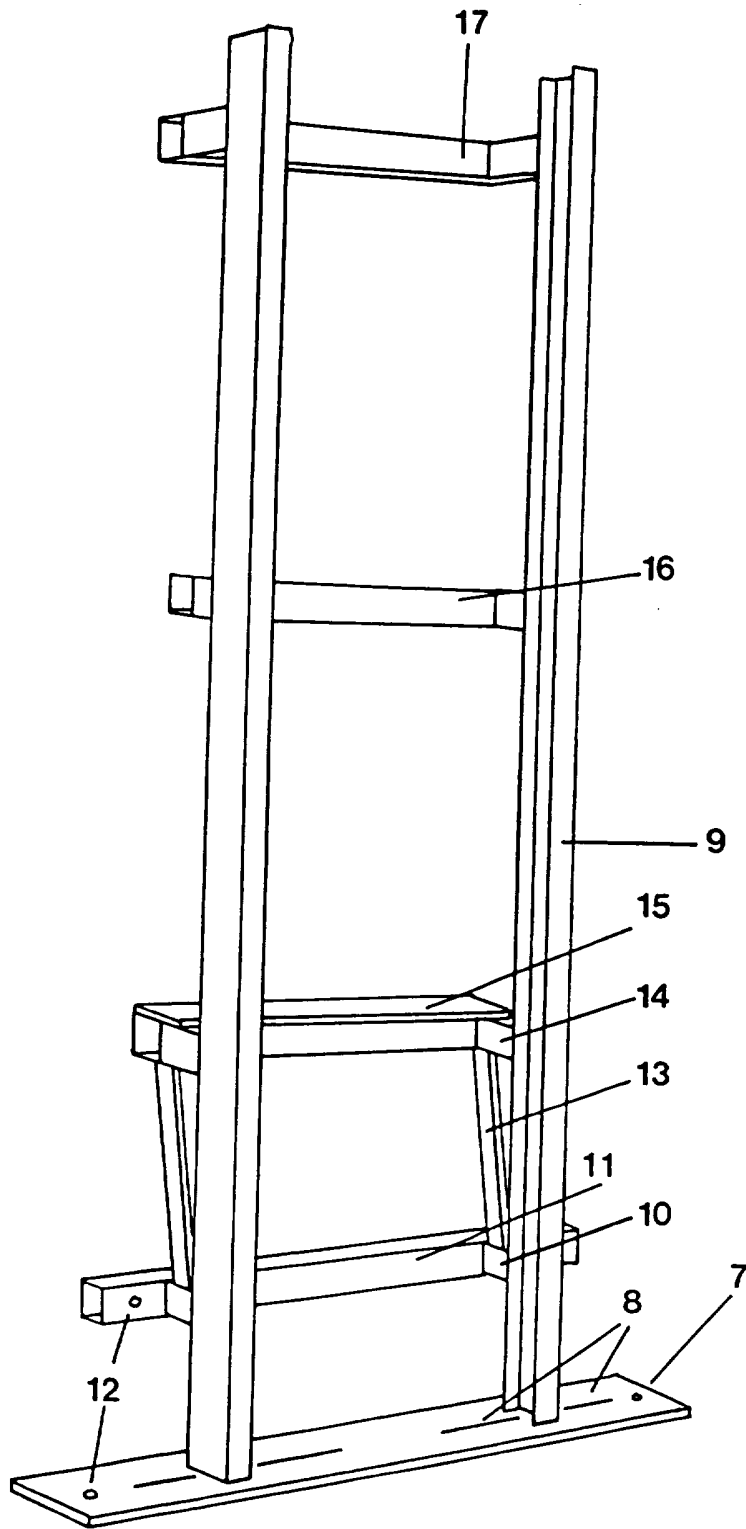
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FIG1.



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FIG 2.



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FIG 3.

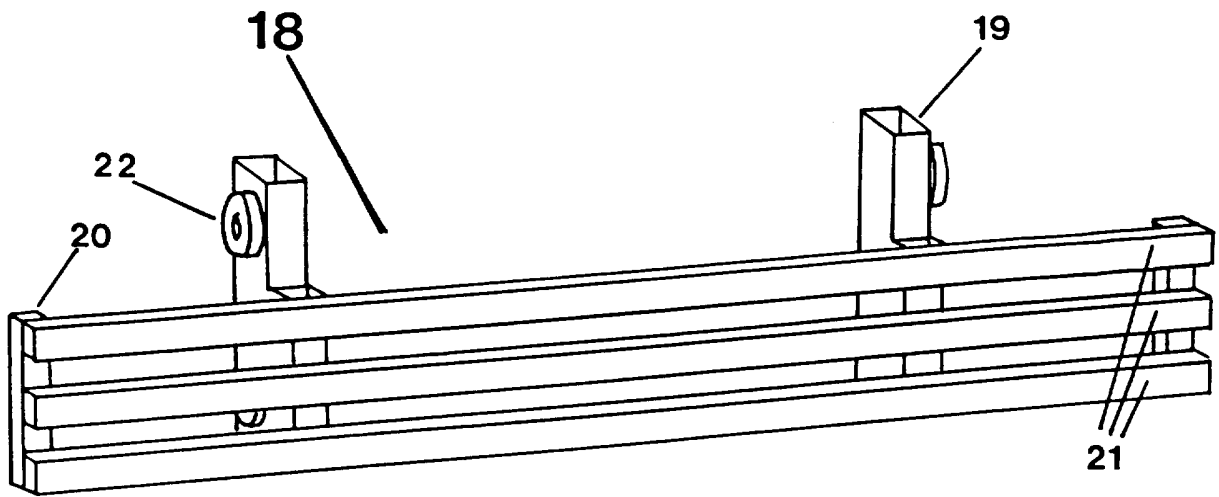
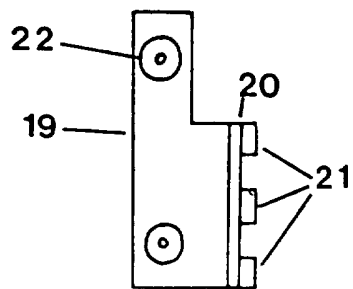
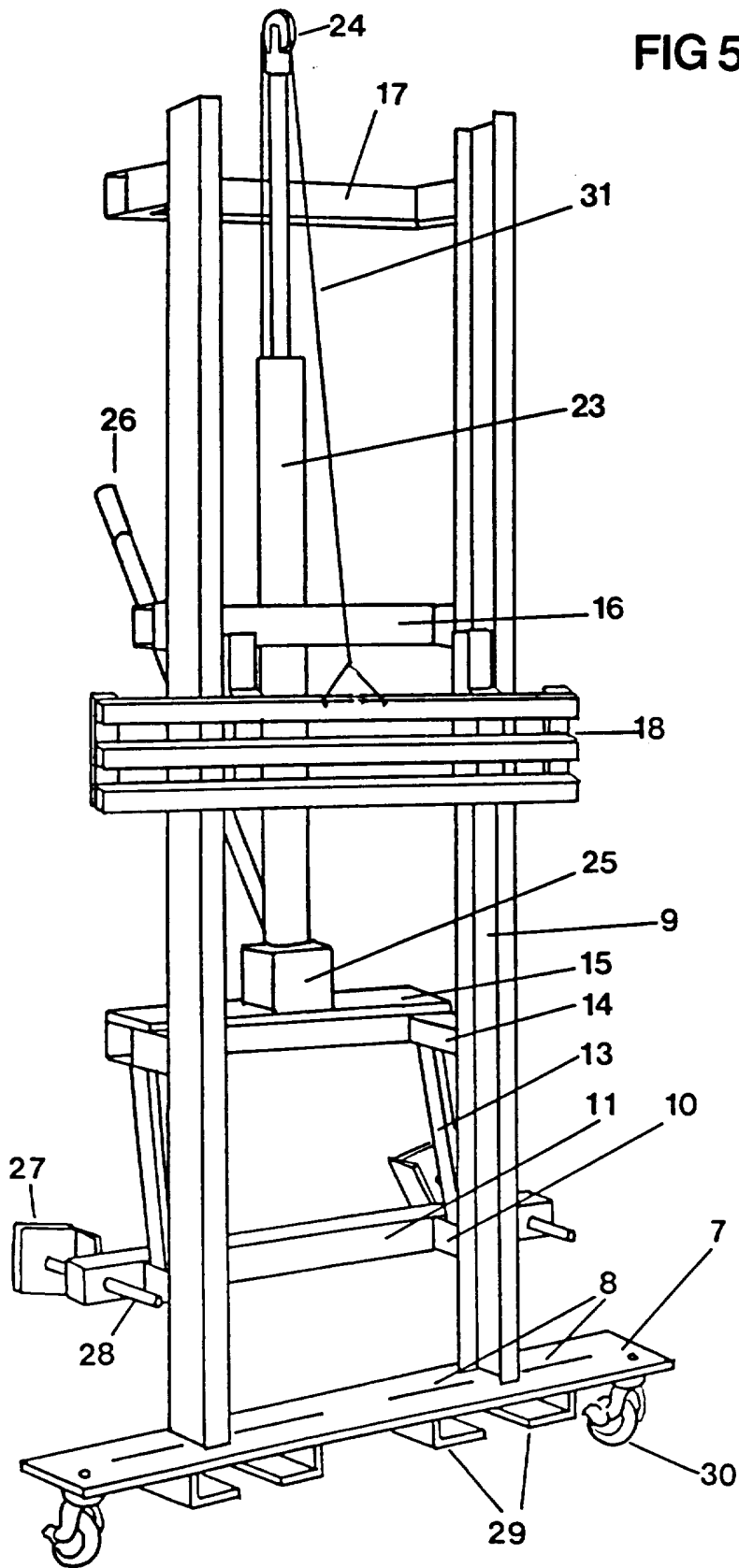


FIG 4.



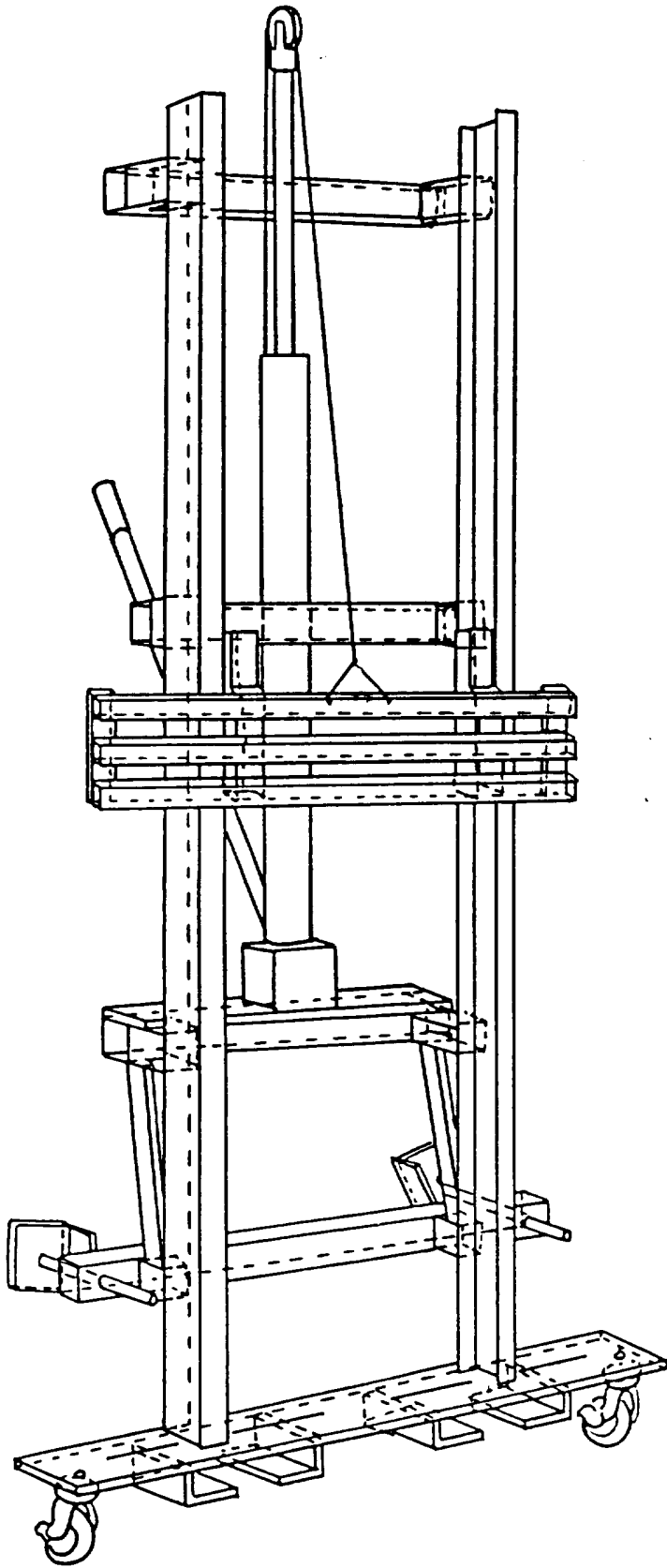
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FIG 5 .



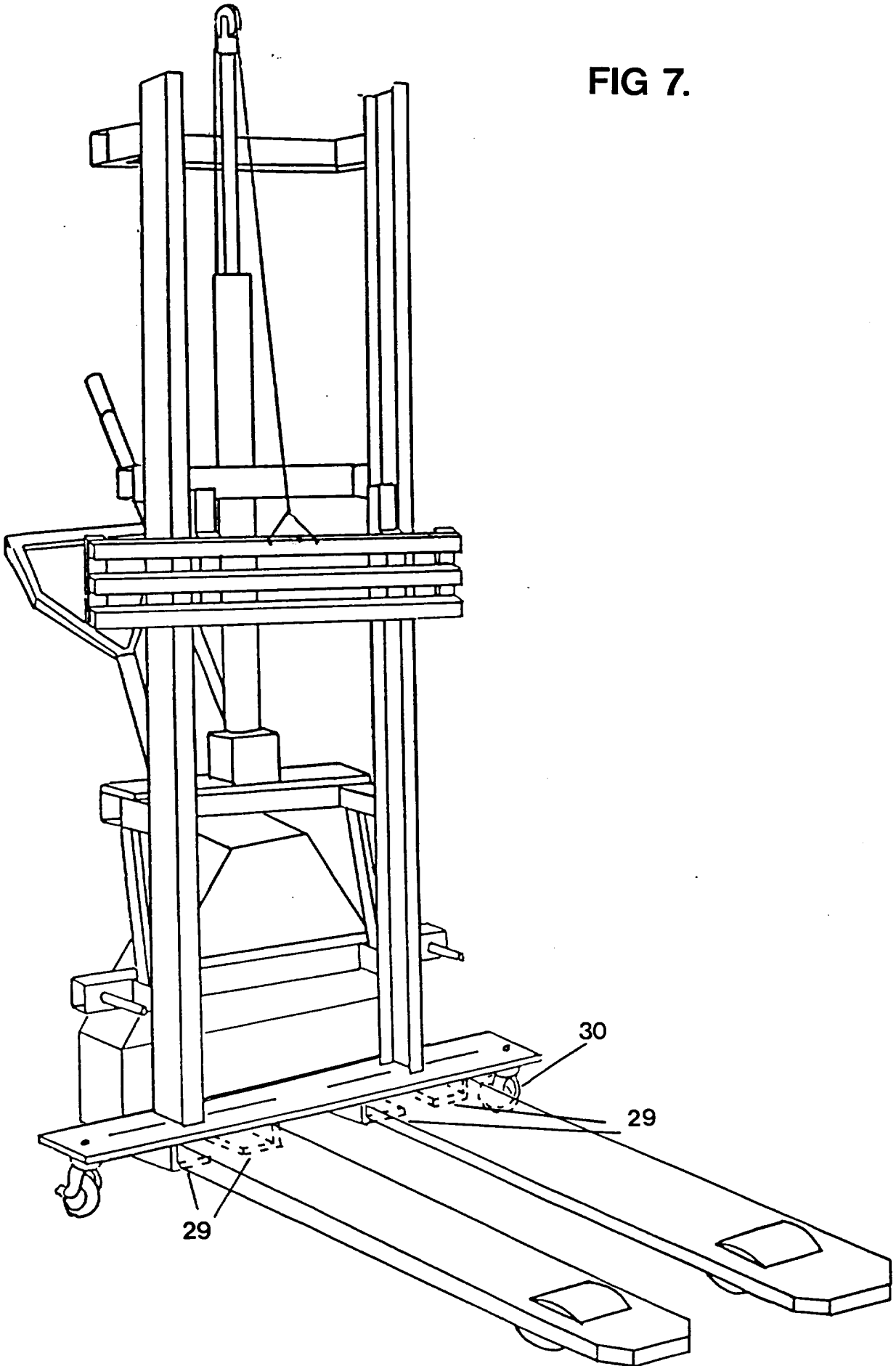
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FIG 6.



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FIG 7.



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FIG 8.

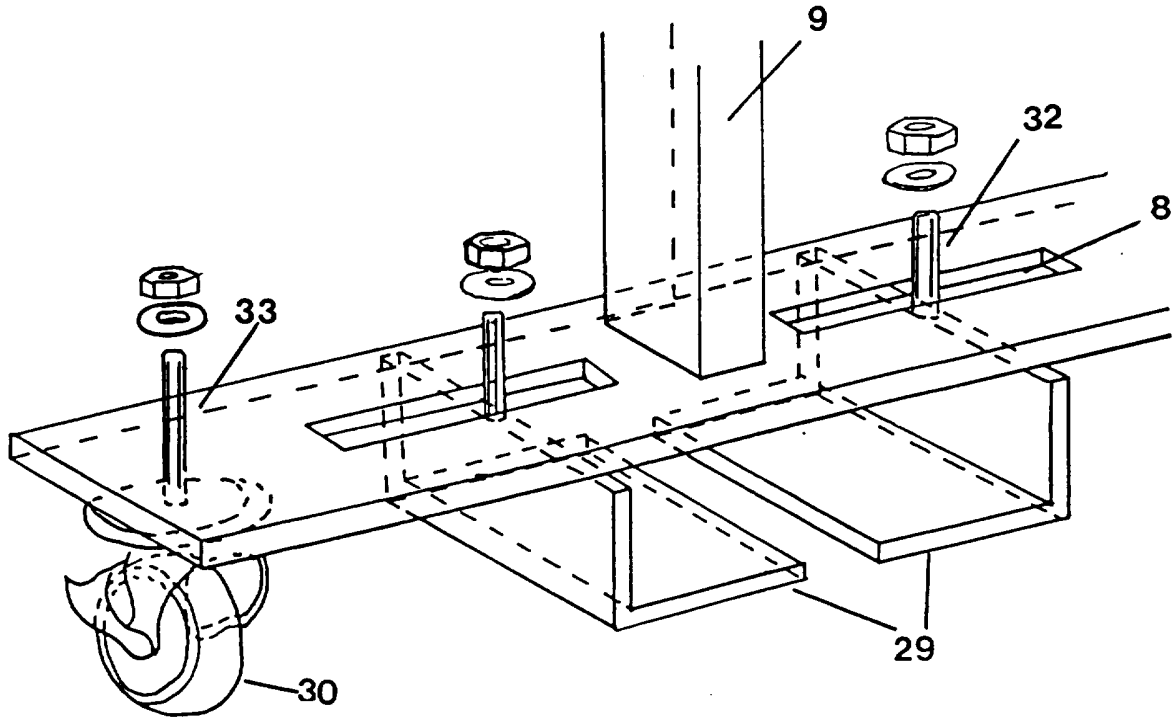
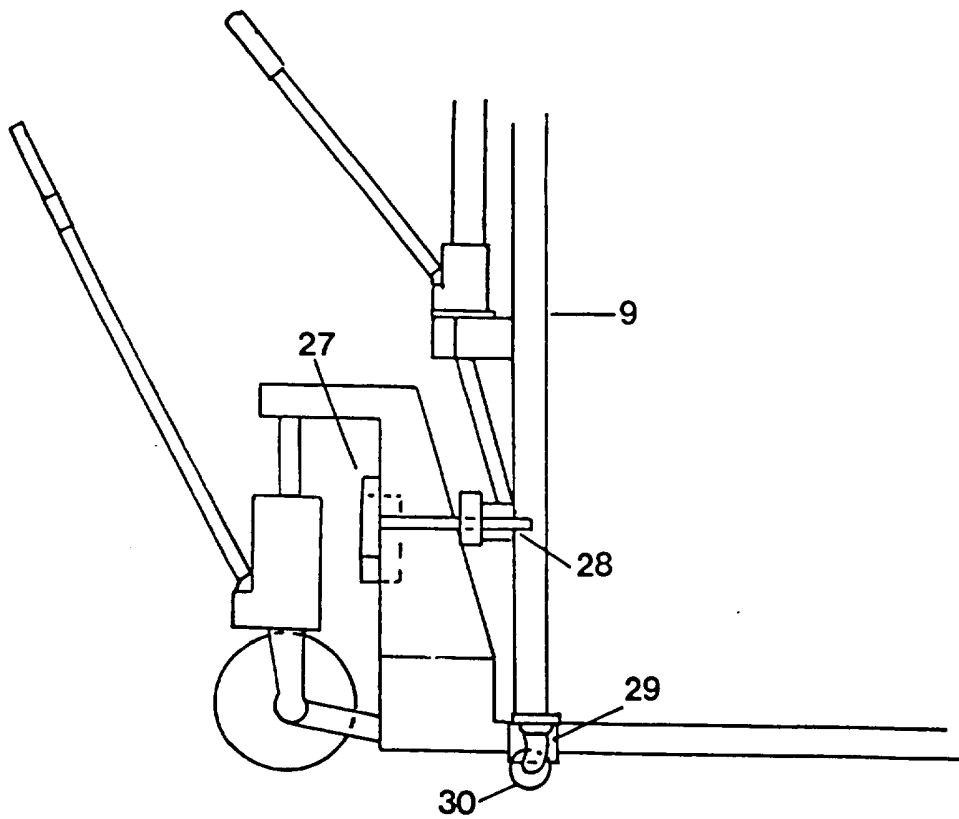
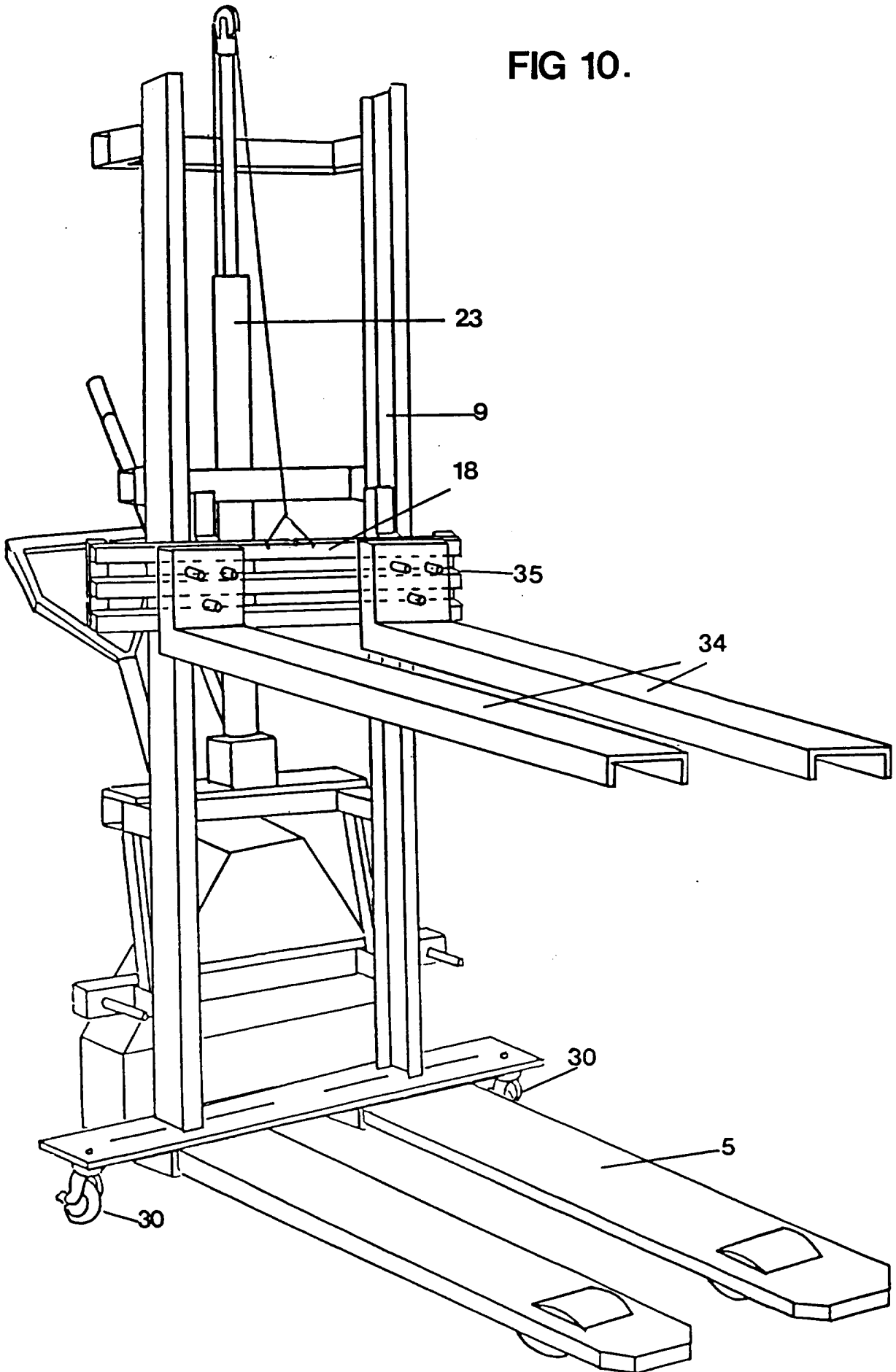


FIG 9.



8..8

FIG 10.



Lifting Attachment For A Pallet Truck

This invention relates to an attachment that will be fitted onto an existing pallet truck.

Pallet trucks are extensively used in warehouse work for the transporting of loaded pallets over small distances and also for the loading and unloading of lorries, notably those models which possess hydraulic lifting platforms.

All pallet trucks, the type of which I will deal with share the same basic appearance and form although some models may vary in size and dimensions. All are hydraulically operated and have an arrangement of two forks protruding from a triangular structure, which forms the rear of the truck. Behind this triangular section is situated a small hydraulic cylinder and hand pump. The pump handle not only operates the pump but it is also the handle by which the truck is pulled.

In order to lift a pallet the two forks are pushed under it and the pump is operated raising the forks and in turn the pallet. To then move the truck the operator must physically pull it, steering the truck by means of the handle which is joined to the pump and is in turn mounted upon an axle between two wheels.

One major drawback with this design of truck is that it is only capable of lifting a pallet a matter of cm's so as to just clear the ground.

Therefore if the pallet is required to be stacked upon a second, or loaded onto a lorry, it is necessary to then use a more sophisticated and expensive fork lift truck.

The purpose of the proposed invention is to allow a normal pallet truck to be transformed into a device that will be capable of lifting a loaded pallet to a height suitable for loading onto the body of a lorry, or for stacking onto a second loaded pallet.

This attachment will be adjustable so as to fit any existing pallet truck regardless of its dimensions. Unlike some pallet lifting systems this invention can only be used in conjunction with a pallet truck and therefore would be ineffective working independently. This means that the consumer of my device would already be in possession of the systems chassis, the pallet truck, so emitting the need for purchasing a whole new device, but instead adding to a present system.

Not only will this invention add to the capability of a pallet truck but will also preserve the truck's original ability.

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Instead of using the pallet trucks own hydraulic system, all lifting of pallets whether it be **cm's** or **m's** would now be controlled by the hydraulic system mounted on my attachment.

It would also be necessary to produce two slightly variant models each using a noticeably different hydraulic arrangement. Firstly where speed of function is the priority a smaller hydraulic ram would be used, the cylinder having a stroke length half the size of the desired lift. Such a cylinder could be geared so as to raise the forks at a rate double to which the cylinder itself operates. This would give a quick functioning time i.e.. the time taken for the forks to be raised and lowered.

Such an arrangement as this could be achieved by passing a flat chain or wire from the rear of the cylinder over the top of the piston head and down to the forks.

A second model would use a full sized cylinder, the stroke length being the same as the required maximum lift.

Although this idea would be slower this model would be more efficient, lifting a weight directly proportional to the force exerted by the cylinder.

Figure 1 shows the original pallet truck, with the hydraulic system shown in hatching lines.

Figure 2 shows the basic steel frame of my device.

Figure 3 shows in detail the vertical slide to which the forks are attached.

Figure 4 again shows the vertical slide this time from the side, with the wheels more apparent.

Figure 5 shows the frame together with the hydraulic arrangement with the wire, the vertical slide, the attaching members and stabilisers.

Figure 6 shows the same as figure 5 but with cross sections indicated by hatching lines.

Figure 7 shows my device attached onto the pallet truck with the attaching members indicated by hatching lines.

Figure 8 shows in greater detail the sliding plates that hold the device to the trucks forks and also the method by which the stabilisers are secured.

Figure 9 shows from the side how the device is held in the upright position against the back of the truck.

Figure 10 shows the forks being bolted to the vertical slide.

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Referring to figure 1, this shows the type of pallet truck which will be used in conjunction with my design.

Dealing with figure 2, the components, 7, and, 15, are constructed from mild steel plates, while components 10, 11, 13, 14, 16 and 17 are formed from mild steel rectangular tubing. These components together with the four holes, 12, and slots, 8, help to comprise the devices basic structure.

Members, 14, and, 15, support the hydraulic equipment which are in turn supported by the diagonal members, 13.

The channelled sections, 9, act as guiding bars for the slide, 18 (See figures 3 and 5). Onto this section will be attached the two forks, 34, and comprises of three mild steel bars, 21, which are fixed onto two 'L' shaped members, 19, constructed again from rectangular steel tubing. At both ends of the horizontal bars, 21, there are attached components 20, made from mild steel plate. When the forks are attached to slide, 18, the end plates will prevent the forks 34, from sliding out at the ends of our bars, 21, and leaving the slide, 18.

At the outer sides of both members, 19, are attached, upon axles at the top and bottom two wheels that will allow the slide, 18, to run smoothly up and down the channelled uprights, 9.

A hydraulic ram, 23, is mounted upon the steel plate, 15, and is fixed in its upright position with its front face resting on the rear of the crossbar, 16 (See figure 5). A flat metal chain or wire rope, 31, is placed over the wheel, 24, mounted on top of the piston head and is attached to the top bar, 21, of the slide and fork mount, 18. This arrangement will give a lift twice that of the cylinder stroke.

Components, 27, and, 28, can then be added to the frame, these consist of long threaded bar, 28, with a right angled plate, 27, attached to one end. The bar, 28, is then passed through the hole, 12, located in crossbar, 11.

The two stabilisers, 30, can also be added by passing the bolt, 33, which located on top of the wheel, through the hole, 12, drilled in the base plate, 7, and holding it there by the use of two nuts, one on either side of the plate, 7.

The four slide plates, 29, that hold the device to the trucks forks can also be added by the same method as with the stabilisers, however the plates, 29, are instead bolted through the slots, 8.

(These processes can be seen in detail in figure 8).

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All of the cross sections can be clearly seen in figure 6.

In order to attach the invention to the pallet truck it is placed across the truck forks, 5, so that the upright channels, 9, are aligned with the centre of the forks, 5, or as near to it as possible (See figure 7).

Then the right angled plates, 29, can be moved along the slots 8 so that each pair sandwich the trucks fork, 5, and enclose both sides and also the bottom of each fork.

When the desired position of the angle plates is achieved they are tightened in place (See figure 8). This prevents the device from moving side to side and also helps it to stay upright.

To add more security to the device and prevent it from tilting forward under its load the threaded bar, 28, can be adjusted so that the angle plate, 27, can hook behind the back of the pallet truck, so holding the device upright (See figure 9).

To attach each fork, 34, to the slide, 18, three bolts are passed through the vertical section of the fork, 34, and also through the spacing between the bars, 21 (See figure 10).

After the nuts and bolts are tightened the forks, 34, are held securely to the slide 18. Note that there are two bolts through the top spacing and one through the bottom, this is to add extra support as there is more force acting at the top of the vertical section than at the bottom.

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Claims.

- 1) A hydraulically operated attachment that when fitted onto a pallet truck will allow it to lift a loaded pallet to a far greater height, making it possible to stack a pallet onto a second or for the loading and unloading a lorry.
- 2) A device as claimed in 1 that will be able to work in conjunction with any size of pallet truck no matter of its dimensions.
- 3) A device as claimed in 1 + 2 which will have two forks, shaped to cover the pallet trucks forks.
- 4) A device as claimed in any of the claims 1 - 3 who's forks will be attached onto a vertical sliding mount which will be able to be adjusted to compensate for any pallet trucks fork spacing.
- 5) A device as claimed in claims 1 - 4 that will be operated by a single hand pumped or battery operated hydraulic cylinder linked to the fork mount either by flat chain or wire rope.
- 6) A device as claimed in claims 1 - 5 that will have two channelled uprights onto which the fork mount can run smoothly up and down.
- 7) A device as claimed in all claims 1 - 6 which will consist of all members referred to in all previous claims, being mounted upon a mild steel frame.
- 8) A device that will be attached on to a pallet truck to allow it to lift a loaded pallet to a greater height as here in before described with reference to and as illustrated in the accompanying drawings.

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Amendments to the claims have been filed as follows

- 1) A transferable and detachable lifting frame that is dependent upon its own hydraulic system and when fitted onto a pallet truck will allow a pallet to be lifted to a height not before possible . This device will also allow pallets to be stacked , a task not capable with a pallet truck alone.
- 2) A lifting frame as claimed in 1 that can be adjusted so as to fit any dimension of pallet truck world wide.
- 3) A device that can be attached onto a pallet truck to allow pallets to be lifted onto high vehicles , or stacked , as herein described with reference to and as illustrated in the accompanying drawings.

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (the Search report)	Application number GB 9417855.5
Relevant Technical Fields (i) UK Cl (Ed.M) B8H (HPC, HSA, HXX, H17) (ii) Int Cl (Ed.5) B62B 3/06. B66F 9/06, 9/065, 9/08, 9/12 Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii) ONLINE DATABASES: WPI	Search Examiner D McMUNN Date of completion of Search 10 NOVEMBER 1994 Documents considered relevant following a search in respect of Claims :- 1-8

Categories of documents

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Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.	E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A: Document indicating technological background and/or state of the art.	&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2231026 A (YOUNG) see Figures 1-3 embodiment	1-7
X	GB 0892494 (SULC) see whole document	1-7
X	W0 82/04241 A1 (BINNEN BRUCK) see whole document	1-7
X	DE 2033504 (RUBNER) see whole document	1-7

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