May 3, 1949. E. H. PETTLER 2,468,999

LIFTING DEVICE

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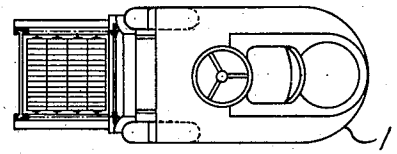


Fig. 1

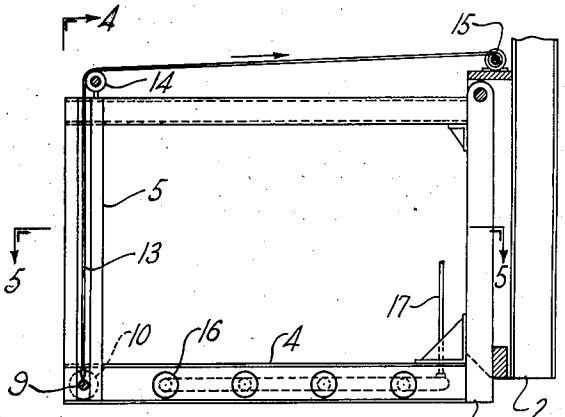


Fig. 3

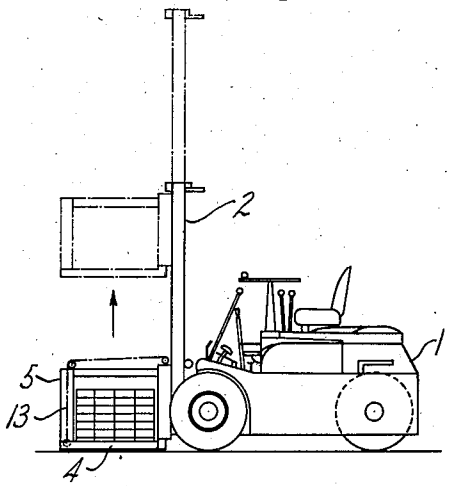


Fig. 2

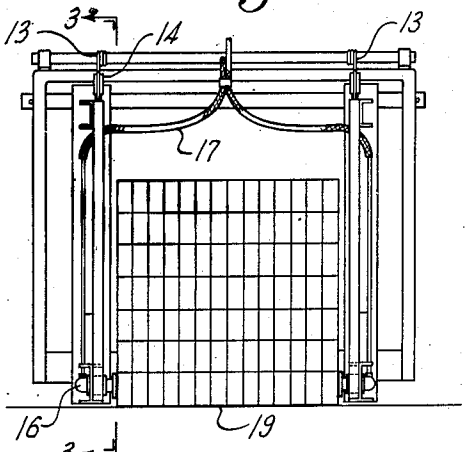


Fig. 4

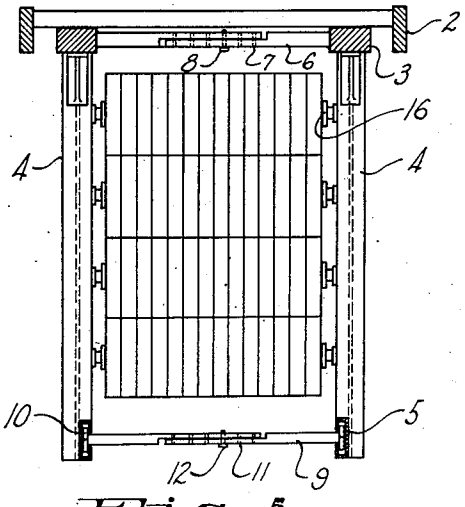


Fig. 5

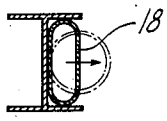


Fig. 6

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LIFTING DEVICE

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2 Claims. (Cl. 214—65.2)

1

This invention relates to lift trucks of the type utilizing a hoisting fork adapted for manipulation of the load on the floor and for stacking or placement purposes.

It is among the objects of the invention to provide an improved form of lifting fork which shall be capable of engaging, lifting and stacking or placing loads consisting of a plurality of units, such as brick, containers and the like, without any bottom supports.

A further object of the invention is the provision of a lifting hoist employing a plurality of gripping devices operable from a common source, including means for locking the gripping elements to the load by their own pressure.

A further object of the invention is the provision of a special lifting device consisting of a plurality of spaced fork members having reinforcing means constituting pressure abutments which shall be movably mounted to facilitate placement of the lifting device around the load to be handled.

These and other objects of the invention will become more apparent from a consideration of the accompanying drawing, constituting a part hereof, in which like reference characters designate like parts, and in which:

Figs. 1 and 2 are top plan and side elevational views, respectively, of a lifting truck utilizing hoist mechanism embodying the principles of this invention;

Fig. 3 a side elevational view of a hoist;

Fig. 4 a front elevational view thereof, illustrating its position relative to a load to be lifted;

Fig. 5 a top plan view of the hoist; and

Fig. 6 a cross sectional view of one form of a pneumatic type of gripping element.

In the drawing the numeral 1 designates a lift truck of a conventional design used in industrial plants for lifting articles in production lines, the truck being no part of the present invention. In the particular lift trucks to which the invention appertains, a hoist in the shape of a elescoping frome member 2 is mounted on the front end of the truck, the particular shape of frame, or whether it be hydraulically or otherwise operated, being of no significance to the present invention.

The movable element of the hoist is a frame member 3, Fig. 5, on which are mounted forks 4 that support and lift the load. These forks are usually in the shape of skids or sleds which may be placed under a loading platform on which the articles to be handled are loaded. In accordance with the present invention the forks are not placed beneath the load but around the side of

2

the load and are provided with side frames 5 of channel shape as shown in Fig. 5. The forks are adjustable to width by a splice bar 6 at the rear having pin holes 7 for receiving a pin 8 whereby the forks 4 may be spaced for loads of different width within the limits of their adjustment. A similar bar 9, having flanged ends 10, is disposed in the channel of the vertical uprights 5. It is likewise a splice bar, as shown, having pin holes 11 for receiving the anchor bolt 12 so that the front bar 9 can be adjusted to the same width as the rear bar 6.

As shown in Figs. 3 and 4, the bar 9 is suspended by cables 13 extending over guide wheels 14 that are wound by a shaft 15 that is preferably motor driven, there being two suspension cables as shown in Fig. 4 to balance the rod 9 in its vertical sliding movement in channels 5.

The fork elements 4 are provided with hydraulic jacks 16 connected to a source of pressure fluid at 17, Figs. 3 and 4, there being four sets of jacks shown, although any desired number may be utilized depending upon the character of the load to be handled.

The forks 4 are preferably I beams in which the jacks 16 are mounted, and in the form of gripping device shown in Fig. 6 an inflatable tube 18 is employed in place of the jacks 16, the tube running the full length of the I beams and being connected to the pressure fluid source 17 to exert a gripping action on the load when inflated, such tube being protected by the flanges of the I beam.

In the drawing, brick 19, such as fire clay brick, is illustrated as the load to be handled, there being four rows of brick seven brick high, as shown in Figs. 4 and 5. The improved form of lifting hoist may also be employed for handling boxes in food factories or in industrial plants where the product is packaged for shipment.

The operation of the above described lifting hoist is briefly as follows. The locking bar 9, Figs. 3 and 4, is raised from the position shown in Fig. 3 where it is in substantial register with the longitudinal axis of the forked members 4 to the upper limit of its travel which is at the top of the channels 5, the winch or motor driven shaft 15 being actuated for that purpose. When it has reached the upper limit of its travel in the channel frames 5, the forks 4 and side frames 5 are separated by a space which may be termed the loading space that has been previously determined by adjustment of the locking bar 9 and the rear bar 6 to suit the width of the load to be handled.

In case of the brick 19, as shown in the draw-

ings, the fork arms 4 have been adjusted to embrace 14 rows of brick with sufficient clearance to clear the jacks 16 when the lifting truck is maneuvered to the position of the pile. The truck is advanced to the position where the forks 4 have been aligned with the stacked brick, as shown in Fig. 5, with the jacks 16 in substantial center of each transverse row of brick. When in this position the winch shaft 15 is operated in the reverse direction to lower the locking bar 9 to the position shown in Fig. 3, and pressure fluid through the source connection 17 is then applied to the hydraulic jacks 16 which exert the necessary gripping pressure against the faces of the bottom row of the brick as shown in Fig. 4. The gripping pressure of the hydraulic jacks 16 reacts against the heads 10 of the tie bar 9 so that the I beam shaped forks 4 are rigidly secured against lateral displacement which would otherwise result from the pressure of the hydraulic jacks abutting against the faces of the brick.

When so engaged the load of brick is rigidly held and adapted to be lifted as shown in Fig. 4 to any desired height within the limits of travel of the telescoping frames 2. The truck then transports the load to wherever it is desired, such as a truck bed for hauling or a stock pile for stacking. When the load has been brought to rest to its new position, the hydraulic pressure of the jacks 16 is released and the front tie bar 9 is again raised by the winch shaft 16 to its upper position to clear the top of the load of brick, in which position the hoist truck is free to back away, leaving the load in place.

Where a flexible tube, such as the member 18 of Fig. 6 is employed in place of the jacks 16, the application of pressure fluid effects a firm gripping action of the forks with the load to be hoisted because the flexible tube 18 will lay itself on any surface with which it comes in contact.

The gripping fork type of hoist, as herein disclosed, may obviously be usefully employed in handling rectangular containers, such as boxes or packages containing food products or the like, and may be utilized for lifting any objects having parallel flat faces, either as single units when of a large size, and in multiple units as in the case of the bricks herein illustrated.

Although one embodiment of the invention has been herein illustrated and described, it will be evident to those skilled in the art that various modifications may be made in the details of construction without departing from the principles herein set forth.

I claim:

1. In a lifting hoist, a pair of gripping forks comprising a plurality of substantially rectangular frames in parallel alignment, the front uprights of which are channel members for receiving a tie rod that is slidable vertically therein, a tie rod disposed in said channels, the ends of which are adapted to interact with said channel to prevent displacement of the tie bar therein, means for raising and lowering said tie bar, and means mounted on the lower horizontal frames of said forks for exerting a gripping pressure on a load disposed between said forks whereby the load is supported on said forks from pressure exerted on the side of the load.

2. A lifting device for truck hoists comprising a pair of I beams having an adjustable spacer bar at the rear thereof to vary the space between the I beams, gripping elements mounted on the inner channels of the I beams, a channel joined to the ends of said I beams and extending vertically a distance in excess of the height of the load to be hoisted, a tie bar movably mounted in said channel members, hoist mechanism for raising and lowering said tie bar to clear the load when the I beams are brought into parallel alignment with the side faces of the load and to secure the I beams against lateral displacement when the gripping means are actuated, and means for energizing said load gripping means to simultaneously subject them to gripping force when brought into engagement with the load.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,213,629	Fontaine	Sept. 3, 1940
2,308,648	De Vry et al.	Jan. 19, 1943
2,323,810	Fontaine	July 6, 1943
2,403,356	Francis	July 2, 1946