

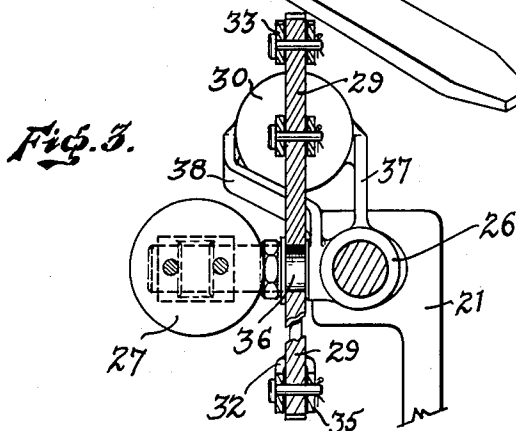
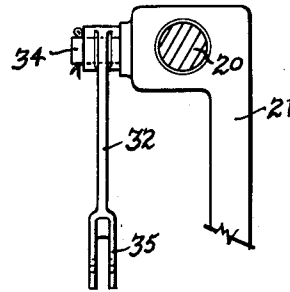
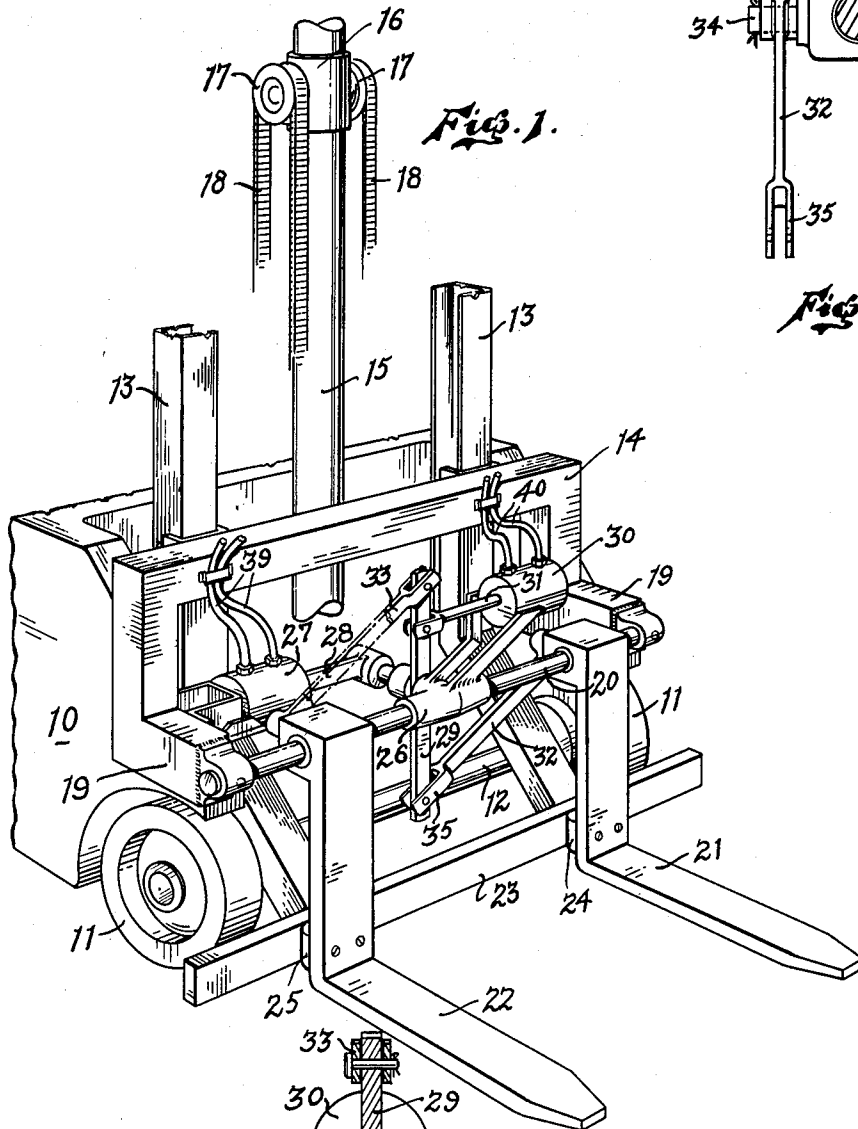
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LATERALLY ADJUSTABLE TINES FOR A LIFT TRUCK

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LATERALLY ADJUSTABLE TINES FOR A LIFT TRUCK

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This invention relates to industrial trucks of the type wherein a carriage is mounted for movement along a vertically disposed mast or boom carried at the front of the truck and wherein the carriage is equipped with outwardly projecting forks or fork tines that are adapted and arranged to be extended under a load, generally supported by a pallet, and which is to be transported from one point to another.

In a load transporting truck of this type it is frequently desirable to change the spacing of the load or pallet engaging forks to accommodate different types of pallets and/or load and at other times it is desirable to shift the forks in unison to one or the other side of the truck center line, as where it is desired to stack a number of loaded pallets in exact vertical alignment without a sidewise maneuvering of the truck.

With the above in mind it is the object of my invention to provide a fork supporting carriage for industrial trucks of this character having a new and novel means by which the forks upon the load elevating carriage may be adjusted laterally with respect to the center line of the truck upon which the carriage is mounted and also with respect to each other to change the spacing thereof irrespective of their position laterally with respect to the truck.

In the past a number of arrangements have been proposed, whereby the spacing of the forks of the fork lifting truck may be varied and to accomplish this resort has generally been had to the use of a right and left hand lead screws with threaded members carried by the forks in engagement therewith. In these arrangements, the turning of the lead screw requires that the operator dismount from the truck in order to operate the screw as by means of a crank or hand wheel. Others have proposed the use of hydraulic cylinders for accomplishing this same purpose, but in these latter instances the hydraulic cylinders merely operate to control the spacing of the forks upon the carriage and are not adapted or arranged to also shift the forks laterally irrespective of their spacing with respect to each other. It is, therefore, a further object of my invention to provide a fork tine mounting for industrial trucks of the character described that is operated hydraulically and is capable of varying both the spacing and lateral positions of the load engaging fork tines and which can be controlled by the operator without dismounting from the industrial truck and in which the control is effective irrespective of the elevation of the fork supporting carriage.

In accordance with my invention, the carriage upon which the load engaging fork tines are mounted is provided with a horizontally extended slideway upon which a fork position controlling member and the fork tines are mounted for lateral movement individually. The location of the fork position controlling member upon the slideway is determined by hydraulic means that is adapted to be controlled by the operator at the controls of the industrial truck and extending from this fork position controlling member there are linkage connections for varying the spacing of the fork tines upon the slideway that are also operated by hydraulic means having control valves

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located adjacent to the controls of the industrial truck.

For a better understanding of the invention reference should now be had to the accompanying drawing, wherein there is shown by illustration and not of limitation a preferred embodiment thereof.

In the drawing;

Figure 1 is a diagrammatic, fragmentary and perspective view showing my invention as applied to a conventional fork lift truck of the so-called boom or mast type.

Figure 2 is a fragmentary sectional view showing a detail of construction, and

Figure 3 is a fragmentary sectional view illustrating a further detail of construction.

In Figure 1 of the drawing I have, for the purpose of illustration, shown my invention as applied to the forward end of an industrial truck 10 of conventional design having a vertical boom and wheels 11 carried by an axle 12. Extending upwardly at this end of the truck 10, I show two members that form the boom or vertically extending rails 13 along which a fork supporting carriage 14 is adapted to move, as is well understood in the art. In this showing there is schematically illustrated a piston rod 15 that is adapted to be extended vertically from a hydraulic cylinder (not shown) and at its upper end this piston rod 15 carries a crosshead 16 with sheaves 17 over which chains 18 are draped. In this arrangement with the chains 18 attached at one end to the frame of the truck 10 and at their other ends to the carriage 14 it will be seen that as the piston rod 15 and the sheaves 17 move upwardly the fork supporting carriage 14 will be also moved upwardly along the boom. Contrariwise when the piston rod 15 is retracted the fork supporting carriage 14 will be lowered along the boom. The fork supporting carriage 14 is here shown as having outwardly extending arms 19 that support a horizontally extending shaft or slideway 20 upon which load engaging fork tines 21 and 22 are slidably mounted. Associated with this slideway forming shaft 20 there is a lower rail or slide 23 over which the fork tines 21 and 22 are guided and held in an extending position by rollers or bearing shoes 24 and 25.

Mounted between the fork tines 21 and 22 and also slideable upon the slideway forming shaft 20 there is a fork positioning member 26, which is controlled by a hydraulic cylinder 27 and operates through a piston rod 28 to move the fork positioning member 26 either to the right or to the left along the slideway shaft 20. Pivotaly mounted upon the fork positioning member 26 intermediate its ends and extending substantially vertically there is a fork tine spacing control member or beam 29. The fork positioning member 26 also supports and carries a hydraulic cylinder 30 that operates through a piston rod 31 to control the pivotal movements of the fork tine spacing control beam 29. In this showing the lower end of the beam 29 is illustrated as connected to the fork tine 22 by means of a link 32 and at its upper end the beam 29 is connected to the fork tine 21 by means of a similar link 33.

As shown in Figure 2 of the drawing the fork tine 21, as is also the case with the fork tine 22, carries a pin 34 to which the outer ends of the links 32 and 33 are respectively attached and at their inner ends the links 32 and 33 have a clevis 35 that is connected to the corresponding ends of the fork tine spacing control beam 29.

As is more clearly shown in the Figure 3 of the drawing the fork tine spacing control beam 29 is mounted upon a cylindrical or shaft-like extension 36 formed as an integral part of the fork positioning member 26 and is free to rock with respect thereto. At this point it will be also noted that the hydraulic cylinder 30 is rigidly mounted upon the fork position controlling member 26 by brackets or arms 37 and 38. As a result, when the fork positioning member 26 is moved in one direction or

the other by the hydraulic cylinder 27 the hydraulic cylinder 30 will be also moved to the right or left in a corresponding degree.

While I have shown the slideway 20 for the fork tines 21 and 22 and fork position controlling member 26 as cylindrical in cross section it is to be understood that this slideway may take many other forms. As for example; it might be of square or rectangular cross-section or it might be composed of a plurality of parallel rods or rails, which of themselves without the employment of the lower rail 23 would provide the sole means for supporting and holding the fork tines 21 and 22 in their extended operative position with respect to the truck 10.

In connection with the operation of my invention, it will be understood that a suitable source of hydraulic fluid or the like will be provided together with suitable hose connections 39 and 40 and control valves (not shown) conveniently located for operation by the truck driver. It is also contemplated that I may use electric motors, operating through a rack or screw, instead of the hydraulic cylinders where this is more practical. As here illustrated the hydraulic cylinder 27 is mounted in a fixed position upon the carriage 14 and as a result the location of the fork positioning member 26 and the fork tines 21 and 22 with respect to the center line of the truck 10 may be controlled through the piston rod 28 by energizing the cylinder 27 for an operation of its piston in either direction. With such an operation the hydraulic cylinder 30 will be also moved with respect to the fork supporting frame 14. Now should it be desired to change the spacing between the fork tines 21 and 22, this may be accomplished by energizing the hydraulic cylinder 30 to move its piston rod 31 in one direction or the other. This, as will be evident, will cause the fork tine spacing control beam 29 to rock about its pivot and thus vary the spacing of the fork tines 21 and 22 upon the slideway shaft 20, irrespective of their location with respect to the center line of the truck 10.

While I have, for the sake of clearness and in order to disclose the invention so that the same can be readily understood, described and illustrated a specific device and arrangement, I desire to have it understood that this invention is not limited to the specific means disclosed, but may be embodied in other ways that will suggest themselves to persons skilled in the art. It is believed that this invention is new and all such changes as come within the scope of the appended claims are to be considered as part of this invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In an industrial truck of the character described, the combination of a vertically extending boom, a load elevating frame mounted for vertical movement along said boom, a horizontally disposed fork supporting slideway carried by said load elevating frame, a pair of spaced fork forming tines mounted upon said slideway with independent freedom of movement along said slideway, a tine spacing controlling member also movable along said slideway for varying the spacing of said fork tines upon said slideway, a beam pivotally mounted intermediate its end upon said tine spacing controlling member for pivotal movement in a vertical plane, a link connecting the upper end of said beam with one of said tines, a second link connecting the other end of said beam to the other of said tines, hydraulic means for rocking said beam about its pivoting axis to vary the spacing of said fork tines with respect to each other upon said trackway, and a second hydraulic means for controlling the position of said tine spacing control member along said slideway, whereby the position of said tines may be changed with respect to the center line of the truck without disturbing the spacing thereof as determined by said tine spacing control member.

2. In an industrial truck of the character described, the combination of a vertically extending boom, a load elevating carriage mounted for movement along said

boom, a horizontally disposed fork supporting slideway carried by said carriage, a pair of fork tines mounted upon said slideway with independent freedom of movement in a horizontal direction along said slideway, a fork position controlling member also mounted upon said slideway between said fork tines with freedom of movement therealong, means mounted upon said carriage having an operating member for moving said fork position controlling member along said slideway, a substantially vertically extending beam pivotally mounted intermediate its ends upon said fork position controlling member, a link extending between the upper end of said beam and one of said fork tines, a second link extending from the other end of said beam to the other of said fork tines, a second means mounted upon and movable with said fork position controlling member having an operating connection for rocking said beam about its pivotal axis upon said fork position controlling member, and control means adjacent the driver's seat upon said truck, whereby the spacing and the position of said fork tines laterally along said slideway may be varied by an operator without dismounting from the truck.

3. In an industrial truck of the character described, the combination of a vertically extending boom, a load elevating carriage mounted for vertical movement along said boom, a horizontally disposed fork supporting slideway with individual freedom of movement in a horizontal direction along said slideway, a fork position controlling member also mounted upon said slideway between said forks with freedom of movement therealong, a hydraulic cylinder mounted upon said carriage having an extending piston rod connected to move said fork position controlling member along said slideway, a substantially vertically extending beam pivotally mounted intermediate its ends upon said fork position controlling member, a link extending between the upper end of said beam and one of said forks, a second link extending from the other end of said beam to the other of said forks, a hydraulic cylinder mounted upon and carried by said fork position controlling member having a piston rod connected to rock said beam about its pivotal axis upon said fork position controlling member, and hydraulic control means for said cylinders adjacent the driver's seat upon said truck, whereby the spacing and the position of said forks along said slideway may be varied by an operator without dismounting from the truck.

4. In an industrial truck of the character described, the combination of a vertically extending boom, a load elevating frame mounted for vertical movement along said boom, a horizontally disposed fork tine supporting slideway carried by said frame, two spaced load engaging fork forming tines mounted upon said slideway with freedom of movement independently of each other, a timed spacing member slideably mounted upon said slideway between said fork tines, a variable linkage connection between each of said fork tines and said fork tine spacing member, means for varying the effective length of the linkage connection between said tines and said fork tine spacing member, and means for moving said fork tine spacing member horizontally along said slideway independently of said first means, whereby said fork forming tines may be moved as a unit laterally along said slideway with a load thereupon and without disturbing the spacing established therebetween by said fork tine spacing member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,795,856	Gravatt	Mar. 10, 1931
2,571,550	Ehmann	Oct. 16, 1951
2,611,497	Backofen	Sept. 23, 1952
2,613,830	Ponnequin	Oct. 14, 1952
2,663,443	Schenkelberger	Dec. 22, 1953
2,665,022	Dunham	Jan. 5, 1954