Aug. 15, 1950 H. PRIESTER 2,519,282

LIFT TRUCK FORK FOR BUILDING BRICKS

Filed Sept. 11, 1946 3 Sheets-Sheet 1

Fig. 1.

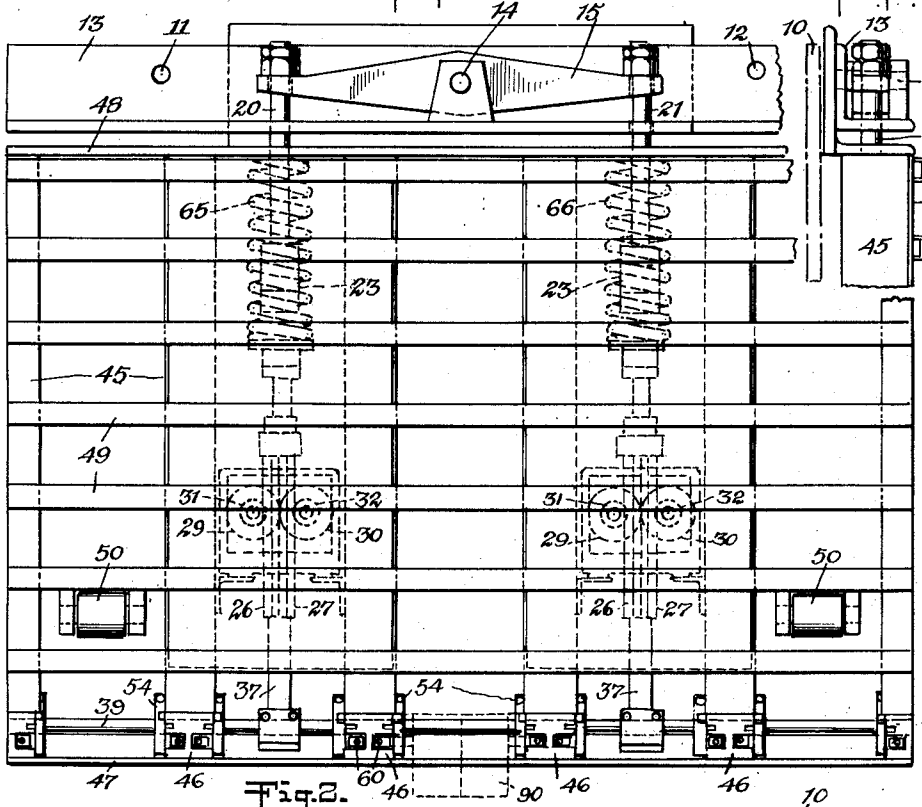
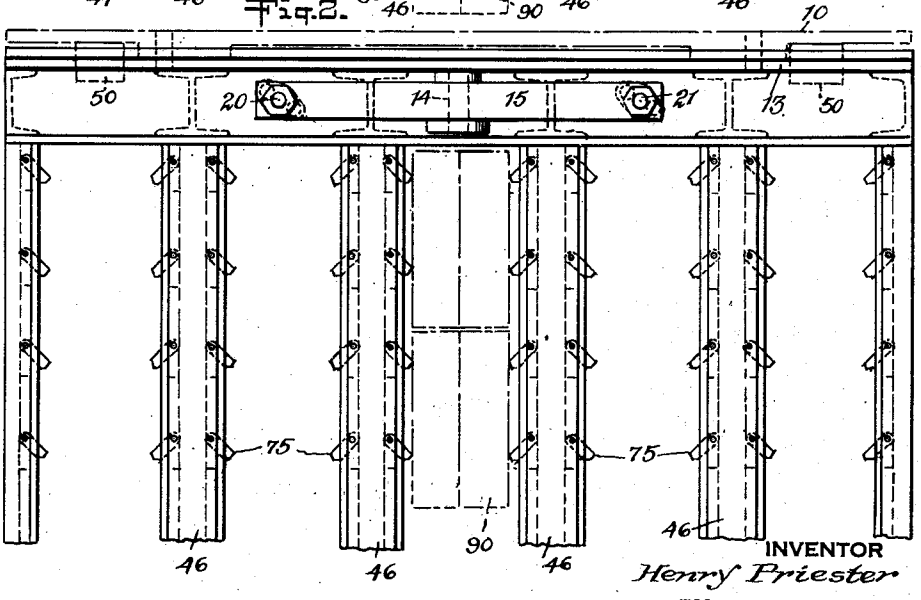


Fig. 3.

Fig. 2.



INVENTOR
Henry Priester
BY
Munn, Liddy & Glascock
ATTORNEYS

Aug. 15, 1950 H. PRIESTER 2,519,282

LIFT TRUCK FORK FOR BUILDING BRICKS

Filed Sept. 11, 1946 3 Sheets-Sheet 2

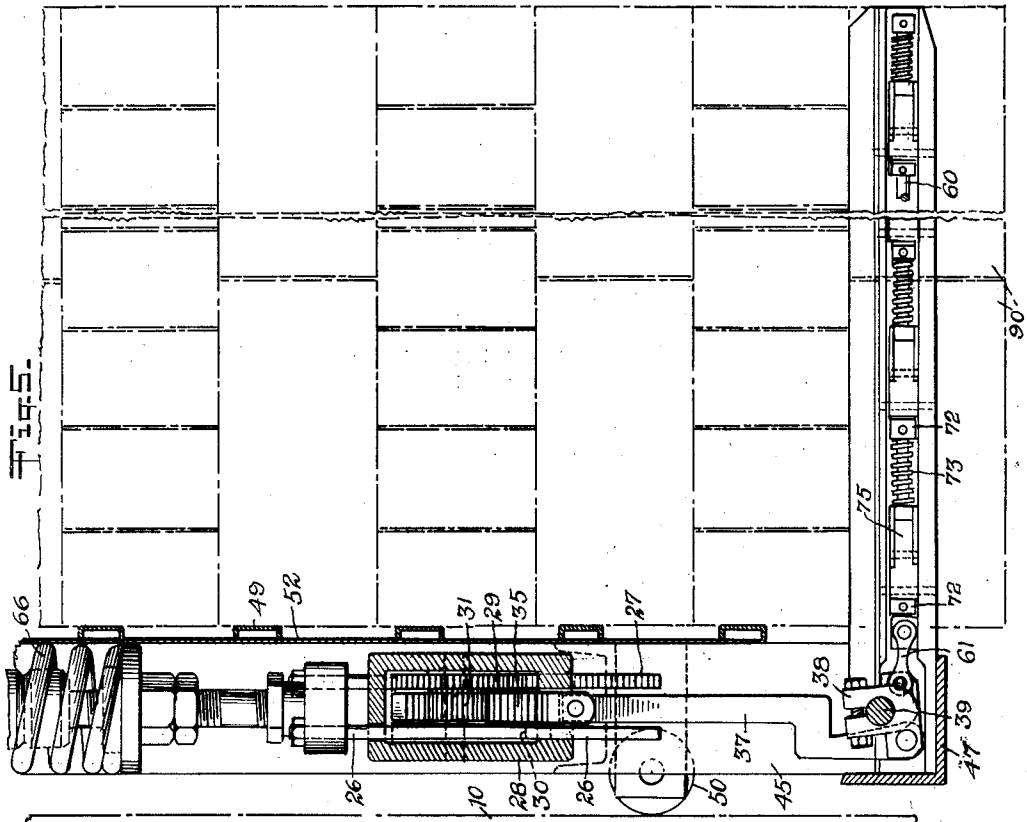


Fig. 5.

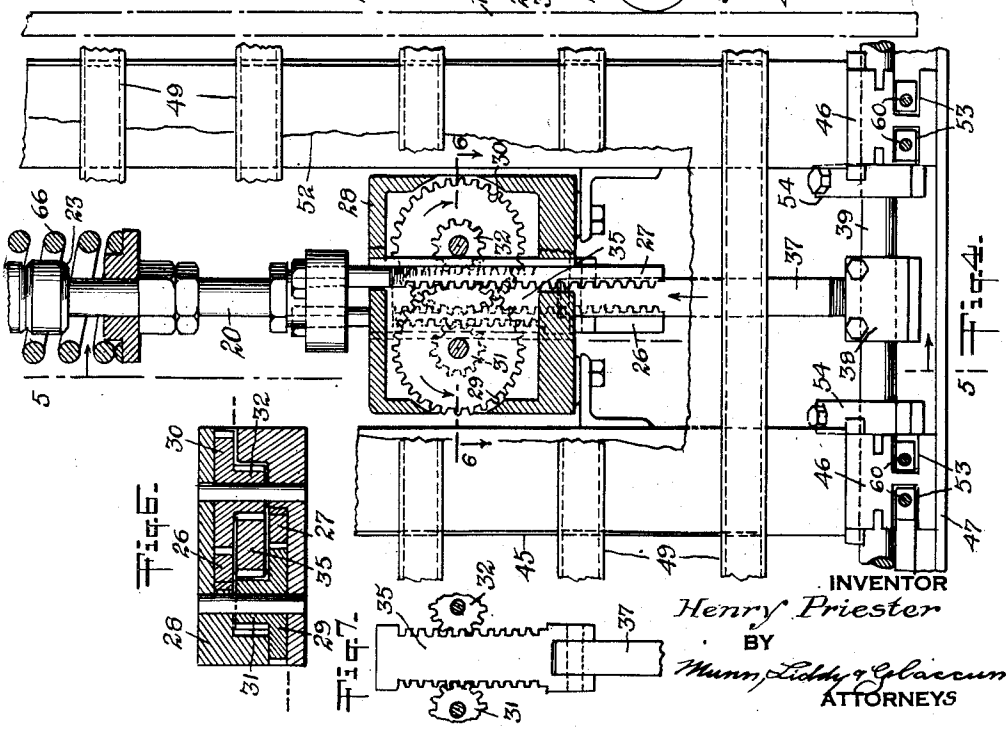


Fig. 4.

Fig. 6.

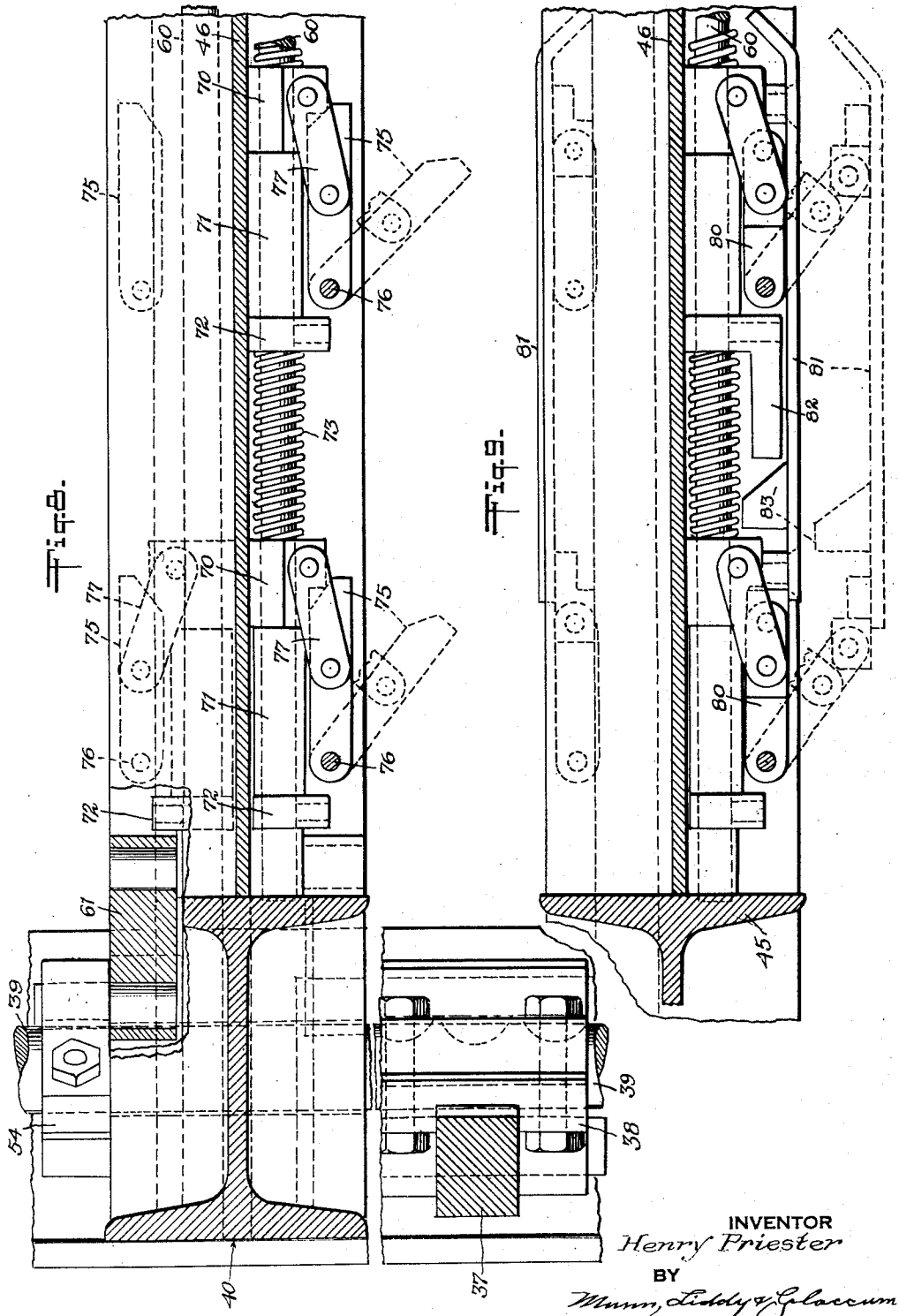
Fig. 7.

INVENTOR
Henry Priester
BY
Munn, Liddy & Glascum
ATTORNEYS

Aug. 15, 1950 H. PRIESTER 2,519,282

LIFT TRUCK FORK FOR BUILDING BRICKS

Filed Sept. 11, 1946 3 Sheets-Sheet 3



INVENTOR
Henry Priester
BY
Munn, Liddy & Glascock
ATTORNEYS

Patented Aug. 15, 1950 2,519,282

UNITED STATES PATENT OFFICE

2,519,282

LIFT TRUCK FORK FOR BUILDING BRICKS

Henry Priester, Middletown, N. Y.

Application September 11, 1946, Serial No. 696,111

5 Claims. (Cl. 214—65.2)

1

This invention relates to a lifting fork for building brick. The principal object of this invention is the provision of a lifting fork which is adapted to be used in conjunction with lift truck to transport large quantities of building brick from one place to another. It is the object of this invention to provide means for loading, carrying and unloading quantity units of brick without any manual operation other than that which is required to operate the lift truck itself. Using a lifting fork in accordance with the present invention, a single worker operating an ordinary lift truck is able to drive over to a unit of building brick, load the unit, transport it and then unload it without touching a single brick. Of course the unit of brick must be laid in accordance with a pre-determined plan which takes into account the features and proportions of the lifting fork. But once this is done, the same unit may be moved into the kiln, left there for burning, and then removed therefrom to a place of storage. From there the unit may be moved to a truck or railroad car for transportation to the building job, and then removed from said truck or railroad car and deposited in a place which is accessible to the mason. All this can be done with the lifting fork herein claimed.

A preferred embodiment of this invention is shown in the accompanying drawing in which—

Fig. 1 is a front elevational view of the lifting fork herein claimed;

Fig. 2 is a fragmentary plan view thereof;

Fig. 3 is a fragmentary end view of the suspension mechanism of the lifting fork;

Fig. 4 is a fragmentary front view partly broken away to show in detail the gear mechanism of the lifting fork;

Fig. 5 is a detailed section on the line 5—5 of Fig. 4;

Fig. 6 is a section through the gear box on the line 6—6 of Fig. 4;

Fig. 7 is a fragmentary enlarged view of part of the gear mechanism;

Fig. 8 is a detailed fragmentary view partly in section showing the brick gripping mechanism of the lifting fork; and

Fig. 9 is a view substantially similar to that of Fig. 8 showing a modified form of gripper.

The lifting fork herein claimed is adapted to be attached by means of a pair of bolts to the lifting frame 10 of any conventional lift truck. These bolts extend through holes 11 and 12 in the suspension member 13 of the lifting fork. This suspension member may comprise a length of angle steel as shown in the drawing.

2

It is suspension member 13 that the lift truck lifts and by virtue of such operation, the lifting fork hereinafter described is itself put into operation. Mounted on the suspension member 13 at 14 is a rocking arm 15. This rocking arm supports at its ends rods 20 and 21 respectively. These rods are vertically disposed and they are adjustable as to length by means of couplings 23. The lower end of each of these rods supports a pair of rack gears 26 and 27 respectively. These rack gears extend through a gear box or housing 28, and in said housing they engage a pair of gear wheels 29 and 30 respectively. These gear wheels are relatively large and affixed to them are smaller gear wheels 31 and 32 respectively. These small gear wheels engage a third rack gear 35. A link 37 is pivotally connected at its upper end to the lower end of the third rack gear 35, and said link is pivotally connected at its lower end to an off-set portion of a bell crank shaped clamp 38. This clamp is fixed to a horizontal shaft 39, and said shaft 39 extends through the frame 40 of the lifting fork.

It will be apparent from the foregoing that when the suspension member 13 which is connected to the lifting frame of the lift truck is raised, a corresponding upward movement of the rocking arm 15 and the bolts 20 and 21 will be caused. This upward movement will be transformed through the gear box into an upward movement of the third rack gear 35 of smaller extent. In other words the extent of travel of the third rack gear will be smaller than that of the rods 20 and 21, and hence of the suspension member 13. This upward movement of the third rack gear will be converted through the link 37 and the clamp 38 into an angular movement of the shaft 39 upon the shaft's longitudinal axis. When such angular movement of the shaft ceases for reasons which will hereinafter appear, the upward movement of the link 37 will communicate itself through the shaft 39 to the frame 40 of the lifting fork. It is at this point, therefore, that the upward movement of the lifting frame of the lift truck is transmited to the frame of the lifting fork. To keep the lifting fork in line with the lifting frame of the lift truck during the lifting operation, thrust rollers 50 are provided in the frame of the lifting fork to engage the lifting frame 10 of the lift truck.

The frame 40 of the lifting fork comprises a plurality of vertically extending posts 45 and a plurality of horizontally extending tines 46 affixed thereto. Horizontally extending members 47 and 48 are affixed to posts 45 at right angles

thereto to complete the framework, and said horizontal member 47 is also affixed to the horizontal tines 46. Course members 49 are affixed at pre-determined horizontal levels to the vertical posts 45 of the frame. These course members serve as back rests for the several courses of brick which the lifting fork is adapted to carry. A shield or plate 52 is affixed to the course members to prevent dust and other foreign material from entering the gear box 28 and the rest of the vertically movable mechanism hereinabove described.

It will be noted that the tines 46 are provided with channels 53, one on each side of each tine. In these channels horizontal rods 60 are disposed, and it will be seen that a link 61 connects the inner ends of these rods to rocking arms 54 which, like clamps 38, are clamped to the shaft 39. These rods are mounted for movement along their longitudinal axes, and it will be evident that when the shaft 39 and the clamps 38 thereon are caused to engage in angular movement, a pulling action upon the rods 60 will be effected through the rocking arms 54 and the links 61. Clamps 38, shaft 39 and rocking arms 54 comprise what amounts to a bell crank assembly, so that the vertical movement of the link 37 is converted into a horizontal movement of the links 61.

From the foregoing it will be understood that the vertical upward movement of the lifting frame of the lift truck is converted into a horizontal backward movement of the rods 60. And it will subsequently be seen that when such horizontal movement of the rods 60 is brought to a halt, further upward movement of the lifting frame of the lift truck will result in corresponding upward movement of the entire lifting fork assembly. It may be noted at this point that vertical rods 20 and 21 are provided with compression springs 65 and 66 respectively. Upward movement of these rods takes place against the action of these springs and hence when the lifting frame of the lift truck is lowered to its original position of rest, the springs 65 and 66 will urge the rods 20 and 21 back to their original position of rest. In consequence of the action of these springs a downward movement of the links 37 is caused, and hence a forward horizontal movement of the rods 60.

Each rod 60 is provided with a plurality of slidable blocks 70, a plurality of slidable spacing sleeves 71, a plurality of stop members 72 and a plurality of compression springs 73. Reference to Fig. 8 will show that the sequence of these several members is as follows: Stop member 72, spacing sleeve 71, slidable block 70, compression spring 73, stop member 72, etc. Stop members 72 are the only members which are fixedly mounted on the rods 60. This may be done by means of set screws or in any other conventional way.

Gripping members 75 are affixed at one end to the tines 46 in the channels formed between the parallel walls of said tines. It will be noted that these grippers 75 are so mounted on pins 76 which are affixed to said tines and that said pins are positioned adjacent the spacing sleeves 71. A link 77 is pivotally connected at one end to the slidable block 70 and at its other end to the gripper 75. It will be understood that longitudinal movement of the slidable member 70 along the rods 60 will result in a pivotal movement of the gripper 75 to the dotted position indicated in Fig. 8. Such pivotal movement is effected when the lifting frame of the lift truck causes an upward movement of the entire vertically movable assembly of the lifting fork hereinabove described. As has already been indicated, when such vertical movement takes place, an inward horizontal movement of the rods 60 is produced. Since the stop members 72 are fixedly mounted on said rods 60, they will move along with said rods and they will, therefore, bear against the forward end of compression springs 73. The rear end of said springs bear against the slidable blocks 70. When, accordingly, such horizontal movement of the stop members 72 takes place, such movement will be transmitted through the springs 73 to the blocks 70. The links 77 will thereby be actuated and they will, therefore, cause the outward pivotal movement of grippers 75 illustrated by the dotted lines in Fig. 8.

In Fig. 9 a modified form of gripper is shown. The members 80 which correspond to the grippers 75 are pivotally connected at their free ends to a gripping plate or shoe 81. Each such shoe is connected to two members 80 so that when these members 80 are moved outwardly to the dotted positions shown in Fig. 9, by reason of the action above described with respect to the grippers 75, the shoe 81 will also move outwardly to the dotted position shown in Fig. 9. This outward position will necessarily be parallel to the original position indicated by the solid lines in Fig. 9. To assist in bringing the shoe 81 outwardly to the dotted line position of Fig. 9, a camming action is provided between an L-shaped block 82 which corresponds to the stop members 72 above described and a beveled block 83 which is affixed to the inside of the shoe 81.

The action of the grippers upon the building bricks 90 is shown in Fig. 2. Each tine 46 is provided with a double row of grippers, one row on each side of the tine, therefore. There are two rows of such grippers between adjacent tines. A double row of bricks 90 is laid down between adjacent tines in the position shown in Fig. 2. When an upward movement of the lifting frame of the lift truck takes place, such movement is converted in the first instance as has already been indicated, to an outward movement of the grippers. This outward movement will bring the grippers into tight contact with the bricks 90. When movement of the grippers against the bricks ceases, further upward movement of the lifting frame of the lift truck will be translated into corresponding upward movement of the entire lifting fork assembly. Since the grippers are in tight contact with bricks 90, these bricks will be lifted by and with the lifting fork. The course of brick as shown in Fig. 2, may be designated as the tine course. Additional courses may be laid upon the tine course and upon the tines, as is shown in Fig. 5. Each course of brick is provided with a back stop in the form of the horizontal bars 49 hereinabove described. This, too, is shown in Fig. 5. The grippers 81 are used in the same manner as the grippers 75 as shown in Fig. 2. The sole difference is that these grippers 81 provide a line or plane contact with the bricks, whereas the grippers 75 provide only a point contact with the bricks.

The above description as has been indicated, is a description of a preferred embodiment of the invention and it is presented solely by way of illustration and not by way of limitation. It will be appreciated that the structural and mechanical features of the present device as above described, may be modified in a great many ways

without any departure from the basic principles of the invention. In all modifications, however, one principle should be present, namely, that an upward movement of the lifting frame of the lift truck should be translated into a horizontal gripping movement of the brick grippers before it is transformed into a corresponding upward movement of the lifting fork assembly as a whole.

I claim:

1. In combination with a lift truck having a lifting frame, a lifting fork having a plurality of horizontally movable gripping members connected to the tines thereof, a vertically movable construction on said fork connected at its upper end to the lifting frame of the truck, and a bell crank mechanism connected to the lower end of said vertically movable construction by means of a gear reduction system and means also connecting said bell crank mechanism to the horizontally movable gripping members, whereby a vertical movement of the lifting frame causes a horizontal movement of the gripping members, further vertical movement of the lifting frame resulting in corresponding vertical movement of the entire fork assembly when horizontal movement of the gripping members is brought to a halt.

2. In combination with a lifting mechanism, a lifting fork, a plurality of laterally movable brick gripping members connected to the tines of said fork, vertically movable means including a gear reduction system for causing such lateral movement of the gripping members when said vertically movable means is moved upwardly, and means interconnecting said vertically movable means with the lifting mechanism to cause such upward movement of said vertically movable means.

3. In combination with a lift truck having a lifting frame, a lifting fork having a plurality of horizontally movable brick gripping members connected to the tines thereof, a vertically movable suspension member on said fork connected

to the lifting frame of the truck, a vertically movable linkage having its upper end connected to said suspension member and its lower end connected to a bell crank mechanism, said linkage including a gear system, rods and links, said rods having their upper ends connected to the suspension member and their lower ends provided with rack gears meshing with said gear system, said links having their upper ends provided with rack gears meshing with said gear system and their lower ends connected to said bell crank mechanism that is operatively connected to said gripping members, the provision and arrangement being such that initial vertical movement of the lifting frame causes the brick gripping members to operate and continuing vertical movement results in the lifting of the entire fork assembly.

4. A lifting fork as set forth in claim 3 and adjustable coupling members on said rods to regulate the inward movement of said gripping members.

5. A lifting fork as set forth in claim 3 and compression springs positioned around said rods to return the brick gripping members to their normal position when the fork is returned to a flat surface.

HENRY PRIESTER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
954,584	Penfield	Apr. 12, 1910
975,713	Penfield	Nov. 15, 1910
1,125,630	Allen	Jan. 19, 1915
1,745,743	Crum	Feb. 4, 1930
1,800,971	Wallace	Apr. 14, 1931
2,033,746	Sullivan	Mar. 10, 1936
2,323,810	Fontaine	July 6, 1943
2,418,693	Breslav	Apr. 8, 1947