

April 1, 1952

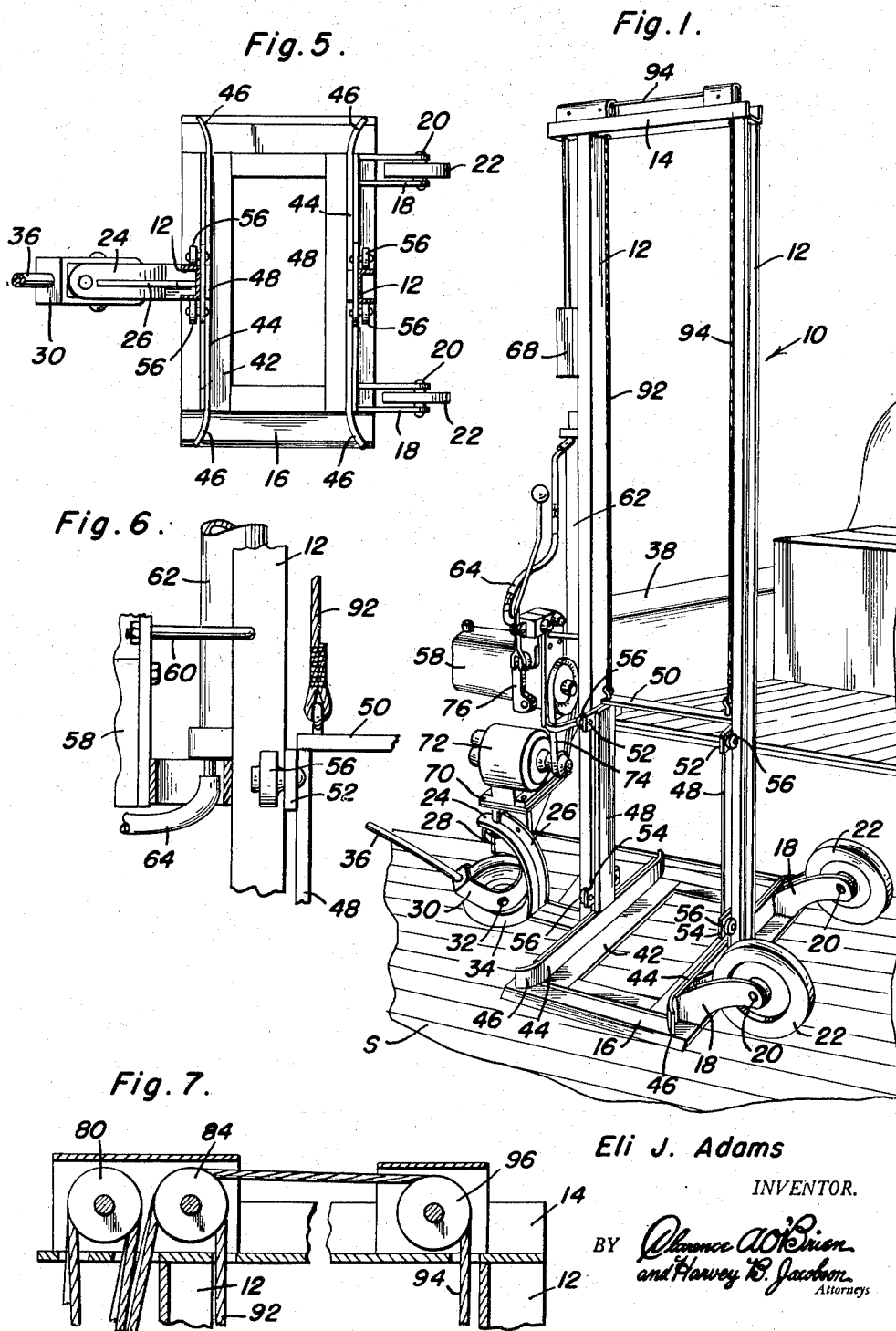
E. J. ADAMS

2,591,489

HYDRAULIC LIFT

Filed Dec. 22, 1949

3 Sheets-Sheet 1



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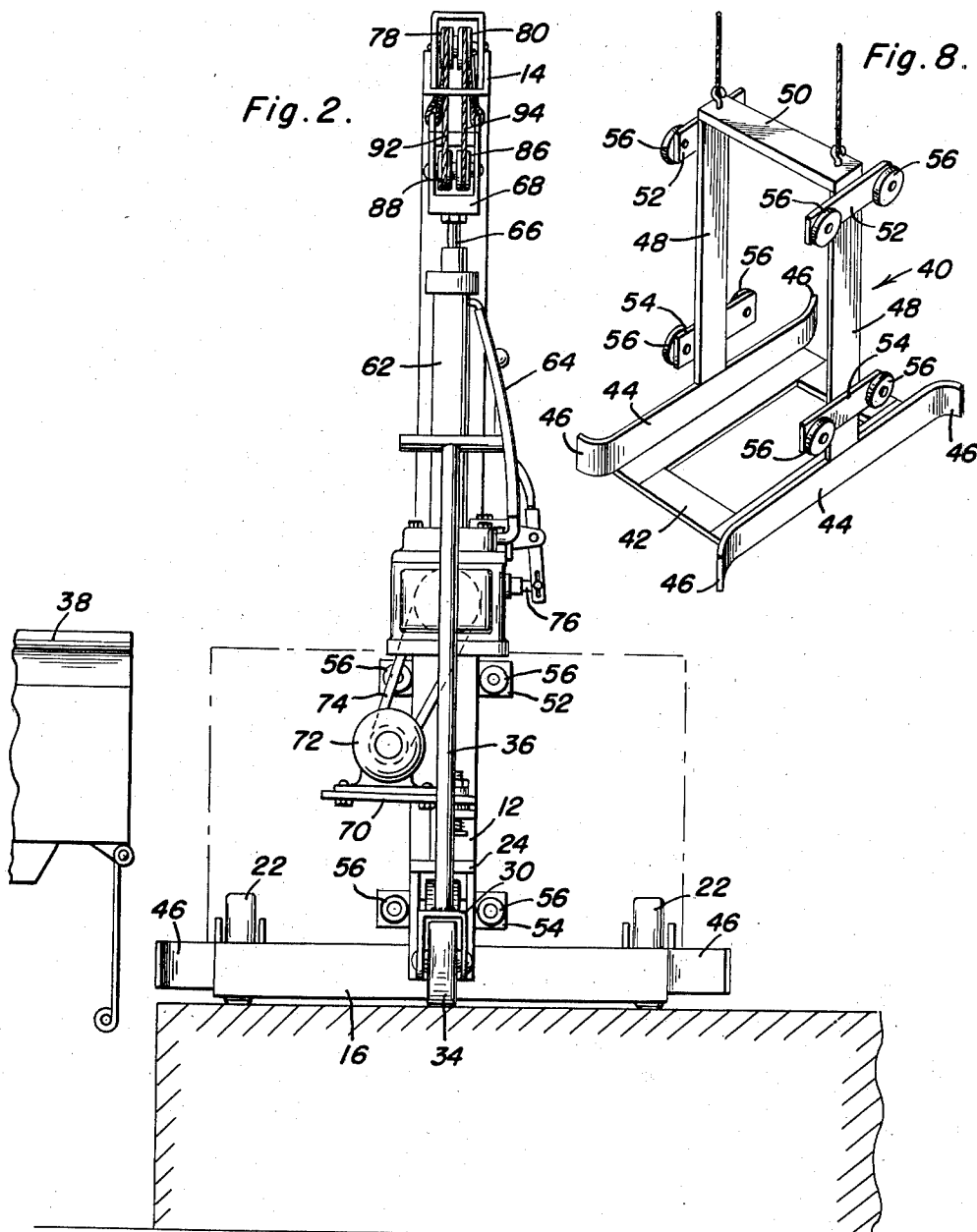
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3 Sheets-Sheet 2



Eli J. Adams

INVENTOR.

BY *Oliver A. O'Brien*
and Harvey B. Jackson
Attorneys

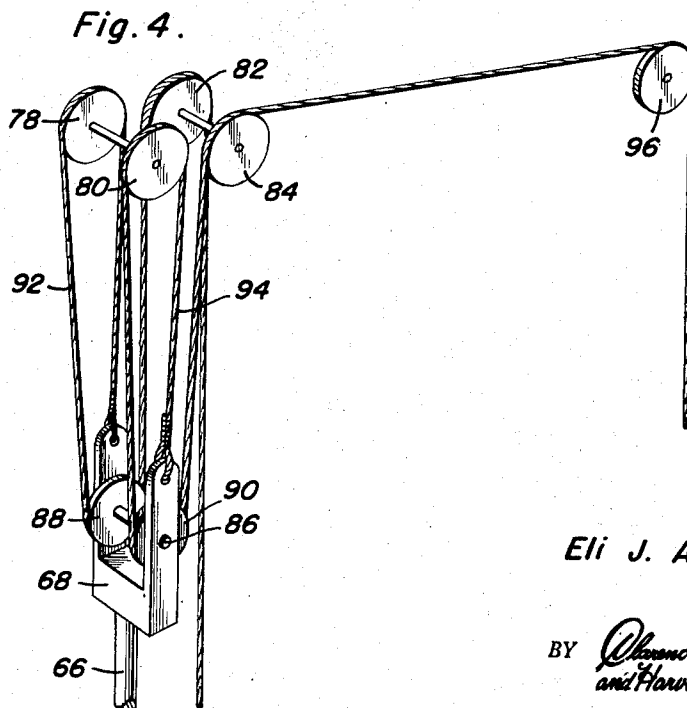
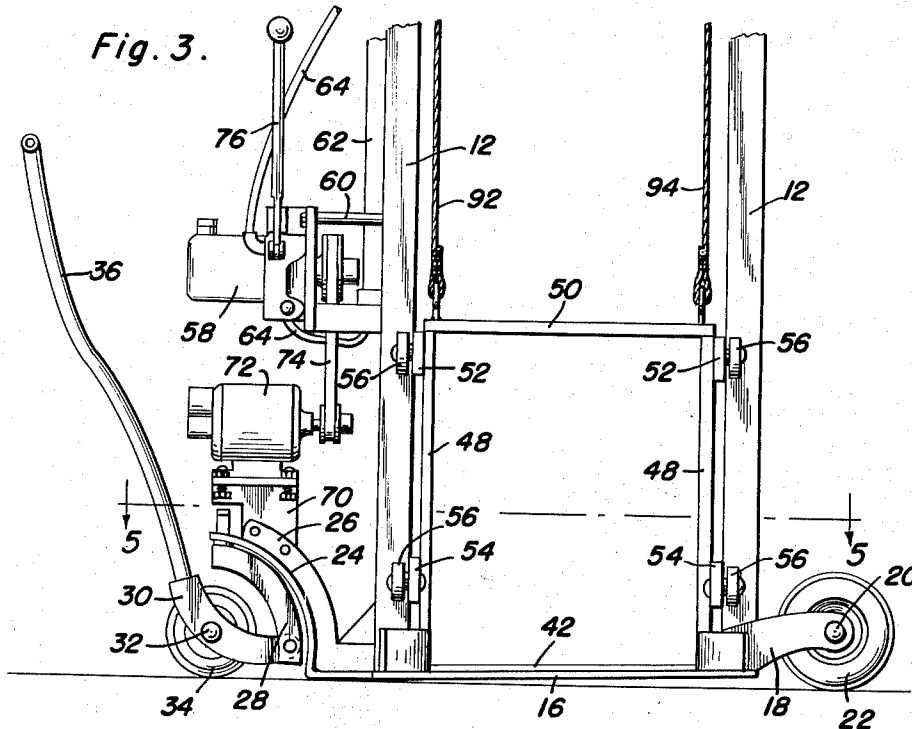
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3 Sheets-Sheet 3



Eli J. Adams
INVENTOR.

BY *Chance A. Olson*
and Harvey B. Jackson
Attorneys

UNITED STATES PATENT OFFICE

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HYDRAULIC LIFT

Eli J. Adams, Rogersville, Mo.

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10 Claims. (Cl. 187-9)

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This invention relates to new and useful improvements in portable elevators and the primary object of the present invention is to provide an extremely small and compact hydraulically operated lift for use in loading and unloading carrying vans in a convenient manner.

Another important object of the present invention is to provide a hydraulic lift including a carriage, a hydraulically operated plunger for raising and lowering the carriage, and a pulley-and-rope forming a connection between the carriage and the plunger and so arranged as to obtain the most advantageous mechanical advantage with very little stress upon the rope.

A further object of the present invention is to provide a portable elevator including a ground wheel structure that is manually manipulated to position the elevator relative to a van being loaded.

Yet another object of the present invention is the provision of a lift embodying a carriage having a pair of guide bars with outwardly curved ends forming guide surfaces for the placement or removal of articles with respect to the carriage.

Another object of the present invention is the provision of a conventional pump including a manually operated valve for the controlled raising or lowering of the carriage so that specially constructed operating mechanism will be obviated.

A still further aim of the present invention is to provide a hydraulic lift that is simple and practical in construction, strong and reliable in use, efficient and durable in operation, light in weight, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the present invention supported on a loading platform and showing a carrying van or truck backed up to the platform;

Figure 2 is a side elevational view of Figure 1;

Figure 3 is a fragmentary front elevational view of the present invention;

Figure 4 is a diagrammatic view showing the pulley and rope means used in the present invention;

Figure 5 is a reduced horizontal sectional view

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taken substantially on the plane of section line 5-5 of Figure 3 with the power means supporting bracket removed;

Figure 6 is an enlarged detail view showing the manner in which the pump is mounted on the frame;

Figure 7 is an enlarged detail sectional view showing the pulley-and-rope arrangement with respect to the frame; and

Figure 8 is a perspective view of the carriage used in the present invention and showing ropes applied to the carriage.

Referring now to the drawings in detail, wherein, for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a frame including a pair of channel-iron uprights 12 and a cross channel iron member 14 terminally fixed to the upper ends of the uprights 12. The lower ends of the uprights 12 are joined by a base plate 16.

Pairs of ears 18 project laterally from the base plate 16. The pairs of ears 18 support axles 20 for wheels 22, so that the frame may be easily moved to a desired location.

A support arm 24 rises from a diametrically opposite side of the base plate 16 from the ears 18 and is reinforced and strengthened by a rib or web 26. A ground wheel mounting 28 is pivoted for horizontal movement on the arm 24 and pivotally supports, for vertical swinging movement, a yoke 30. The yoke holds an axle 32 for a ground wheel 34 and is secured to a lever or handle 36 which is lowered to raise the frame and to permit the frame to be manipulated into position to a carrying van or truck 38.

The numeral 40 designates a carriage or movable platform consisting of a lower wall 42 to which there is secured a pair of spaced parallel guide bars 44 having outwardly curved ends 46 that constitute guide surfaces for guiding an article between the bars 44. A pair of vertical arms 48 rise from the bars 44 and are joined by a cross-bar 50.

Upper and lower cross-pieces 52 and 54 are fixed to the arms 48. The cross-pieces 52 and 54 are disposed perpendicular to the arms 48 and rotatably support rollers 56 at their ends that track upon the uprights 12. The arrangement of the cross-pieces and the rollers prevents lateral movement of the carriage relative to the uprights.

A suitable and well-known hydraulic pump 58 is detachably secured to one of the uprights 12 by fasteners or the like 60. One port of the pump 58 is connected to one end of a pump cylin-

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der 62 and the other port of the pump 58 is connected to the other end of the pump cylinder 62, through the medium of flexible tubing 64. A plunger or piston 66 is slidably received by the cylinder 62 and includes a bifurcated upper end portion 68.

The mounting 24 supports a motor mounting 70 on which there is positioned a motor 72 that is operatively connected to the pump 58 through the use of a pulley drive connection 74.

The pump 58 includes a spring-urged valve and an operating mechanism 76 for the valve. The pump valve is urged by a spring to a neutral position and when the mechanism 76 is manually operated, the piston 66 can be selectively raised or lowered.

Means is provided for connecting the plunger 66 to the carriage so that as the plunger is raised the carriage will be lowered, and as the plunger is lowered the carriage will be raised.

A first pair of pulleys 78 and 80 are journaled on the cross member 14 adjacent a second pair of pulleys 82 and 84 also journaled on the cross-member 14. The bifurcated end portion 68 supports a pin 86 on which there is mounted a lower pair of pulleys 88 and 90.

A first flexible element or rope 92 is anchored at one end to one furcation of the portion 68, and extends over the pulley 78, under the pulley 88, over the pulley 82, and is then attached to the cross-bar 50.

Another flexible element or rope 94 is secured at one end to the other furcation of the portion 68, is trained over the pulley 80, under the pulley 90, over the pulley 84, and over a further pulley 96 journaled on the end of the cross-member 14 remote from the pulleys 78, 80, 82, 84. The element 94 is then attached to the cross-bar 50 of the carriage 40.

In practical use of the present invention, the carriage is lowered by moving the mechanism 76 in one direction and the frame is moved on a platform or support S into position to a truck 38 by manipulation of the lever 36.

A suitable article is then pushed onto the carriage and, by manipulation of the mechanism 76, the carriage and article thereon are raised to a selected position so that the article may be forced onto the truck.

A similar procedure may be followed, in reverse, for unloading the truck, that is, taking articles from the truck or stack of articles and placing them on the ground or a platform.

The principal feature of the present invention is to provide a machine for use in tiering ice in storage rooms in ice plants. However, many other obvious functions are suggested through the description and drawings.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A portable elevator comprising a frame including a pair of uprights, a carriage disposed

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between and extending transversely through the plane of the uprights and movable vertically on the uprights, upper and lower pairs of anti-friction members carried by the carriage tracking on the uprights and preventing lateral movement of the carriage relative to the uprights, said uprights extending between the anti-friction members of each pair of anti-friction members, jack means carried by the frame including a vertically movable plunger, means connecting the plunger to the carriage for raising of the carriage during lowering of the plunger, and guide means on the frame for said connecting means.

2. A portable elevator comprising a frame including a pair of uprights, a carriage extending between transversely through the plane of the uprights and movable vertically on the uprights, pairs of anti-friction members carried by the carriage tracking on the outer faces of said uprights and preventing lateral movement of the carriage relative to the uprights, jack means carried by one of the uprights and disposed at one side of the frame, said jack means including a vertically movable plunger, flexible elements connecting the carriage to the plunger, and pulleys journaled on the frame receiving the flexible elements.

3. A portable elevator comprising a frame including a pair of uprights, a carriage extending between and transversely across the plane of the uprights and movable vertically on the uprights, anti-friction members carried by the carriage tracking on the uprights and preventing lateral movement of the carriage relative to the uprights, jack means carried by one of said uprights and disposed at one side of the frame including a vertically movable plunger, an upper group of pulleys journaled on the uprights, a lower group of pulleys journaled on the plunger, and flexible elements secured to the plunger and to the carriage, said elements being trained over the upper group of pulleys and under the lower group of pulleys.

4. A portable elevator comprising a frame including a pair of uprights, an elongated carriage having ends projecting laterally from opposite sides of the uprights, said carriage being movable vertically on the uprights and including a pair of vertical arms, upper and lower cross-pieces fixed on the arms and disposed perpendicular to the arms, rollers on the ends of said arms riding upon the uprights, said uprights being located between the rollers on the upper cross-pieces and between the rollers on the lower cross-pieces, and hydraulic means operatively connected to the carriage and mounted on the frame for selectively raising and lowering the carriage.

5. The combination of claim 4 wherein said carriage includes a pair of spaced parallel horizontal guide bars having outwardly curved end portions forming guide surfaces.

6. The combination of claim 4 and a ground wheel mounting journaled for rotation on the frame and rotatably supporting a wheel, and a lever attached to the mounting for manipulating the mounting to move the frame into a desired position.

7. The combination of claim 4 wherein said hydraulic means includes a vertically movable plunger connected to the carriage, a pump for moving the plunger and including a manually operated valve, and power means for the pump.

8. A portable elevator comprising a frame including a pair of uprights, a carriage movable

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vertically on the uprights, a wheel mounting secured to one of said uprights, a ground wheel carried by said mounting, hydraulic means supported on said one of said uprights and operatively connected by said carriage for selectively raising and lowering the carriage, and a power means for said hydraulic means supported on said mounting and operatively connected to said hydraulic means.

9. A portable elevator comprising a frame including a pair of uprights and a cross member joining the upper ends of said uprights, a carriage slidably carried by said upright for vertical movement, a vertically movable plunger paralleling said uprights, an upper pair of guide members rotatably supported on the cross-member, a pulley rotatably supported on said cross-member, a lower guide member rotatably supported on the plunger, a first flexible element terminally attached to said plunger and said carriage and trained over both of said upper guide members and said pulley and also trained under the lower guide member, and a second flexible element terminally attached to said plunger and

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said carriage and being trained over both upper guide members and under the lower guide member.

10. A portable elevator comprising a frame including a pair of uprights, an elongated horizontal carriage having a central transverse portion medially its ends lying on a plane passing through the axes of said uprights, means carried by the carriage tracking on the uprights during raising and lowering of the carriage on the uprights, and means mounted on one of said uprights and disposed at one side of the frame and operatively connected to said carriage for selectively raising and lowering the carriage.

ELI J. ADAMS.

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