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AIR LIFT TRANSFER DEVICE

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2 Sheets-Sheet 2

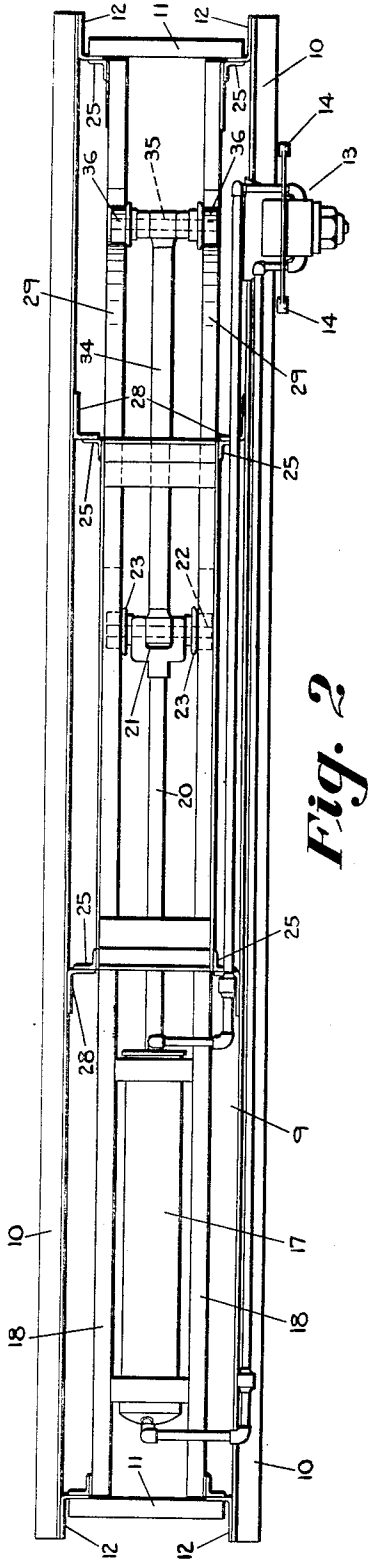


Fig. 2

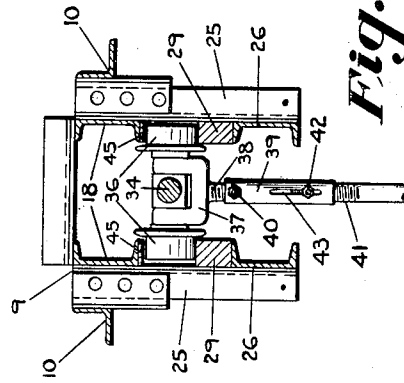


Fig. 4

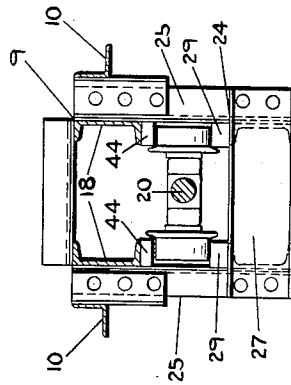


Fig. 3

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AIR LIFT TRANSFER DEVICE

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10 Claims. (Cl. 214—1)

This invention relates to new and useful im-
provements in air lift transfer devices primarily
designed for lifting and transferring from one
place to another, heavy objects which cannot be
expeditiously handled by manual labor.

An important object of the invention is to
provide means for transferring such heavy objects
from one point to another and at the same
time elevating and lowering such objects during
transit.

A still further object of the invention is to
provide a load carrier associated with the transfer
device in a manner which will expedite the
association of an object representing the load as
well as the disconnection of such load there-
from.

A still further object of the invention is to
provide a gravity conveyor in association with
the discharge station of the air lift which utilizes
the weight of the load for propelling the same
away from the unloading station and to provide
means which will expedite the movement of
the load up to the loading station of the air lift.

Other objects and advantages of the invention
will become apparent during the course of the
following description.

In the accompanying drawings forming a part
of the description and wherein like numerals
are employed to designate like parts:—

Figure 1 is a side elevation of the combined air
lift and transfer device;

Figure 2 is a top plan of the same;

Figure 3 is a transverse section of the same
taken on the line 3—3 of Figure 1; and

Figure 4 is a transverse section taken on the
line 4—4 of Figure 1.

In the installation of this device, a framework
9 of structural iron may be suspended either
from the structural work of the building in which
the apparatus is to be installed, or from any
suitably auxiliary framework. This suspended
frame 9 comprises essentially a pair of horizontal
spaced parallel angle beams 10 connected at
their ends by transverse braces 11 having angle
cleats 12 at their ends for attachment to the
inner vertical flanges of the horizontal beams 10.
At one end of this framework, an air control
mechanism 13 is suitably supported by one of
the horizontal beams 10 and is equipped with a
pair of valve handles 14 having operating cords
15 depending therefrom to a point within easy
reach of an operator. This air control mechanism
is of any well known type having a suitable
inlet and outlet for the air whereby it may
be admitted at the will of the operator through

the pipes 16 or 16' to either end of an air cylinder
17 suspended from a pair of horizontal spaced
parallel beams 18 which are suspended from the
cross braces 11 and angle cleats 12 as shown in
detail in Figure 2. This air lift cylinder 17 is
of the well known construction having reciprocally
mounted therein, piston 19, the rod 20 of which
projects through the inner head of the cylinder
to be disposed horizontally as shown. The outer
end of this piston rod 20 is forked as at 21 to
provide bearings for an axle 22 having wheels
23 rotatably mounted on its outer ends, consti-
tuting a cross-head.

In order to provide a track for these wheels,
a track frame 24 is suspended from the horizontal
beams 10 by means of vertical angle bars 25.
To the lower ends of these bars are secured a
pair of horizontal spaced parallel side rails 26,
which, rails at their ends, are connected by
means of channel braces 27 to retain the rails
26 spaced the same distance apart as the beams
18. The angle bars 25 are suitably braced from
the beams 10 against angular deflection by means
of the corner cleats 28. Mounted on the upper
horizontal flange of the rails 26 are cam rails 29
forming tracks for the wheels 23. Beyond the
range of movement of these wheels the rails 29
are provided with cam portions or inclined planes,
the medial portion 30 of which is horizontal
while the two ends thereof incline in opposite
directions as at 31 and 32, the former terminat-
ing in a horizontal portion 33 constituting the
loading portion of the transfer device.

The load sustaining carriage includes a hori-
zontally extending bar 34 pivotally connected at
its rearward end to the axle 22 in the bifurcation
of the fork 21. The other end of this bar 34 is
provided with a horizontal bearing for an axle 35
to the outer ends of which are secured wheels 36
adapted to ride up and down the cam portions of
the track. Pivotally suspended from this axle
is a fork 37, the bifurcation of which surrounds
the forward end of the rod 34. This fork is pro-
vided with a threaded dependency 38 which is
threaded into a sleeve coupling 39. The coupling
is prevented from accidental turning movement
on the dependency by means of a set screw 40 ex-
tending through the sleeve for engagement with
the dependency 38. Into the lower end of this
sleeve is threaded a shank 41 of a load carrying
hook. To prevent accidental rotation of the shank
41 in the sleeve, a set screw 42 extends from a
threaded aperture in the shank through a ver-
tical slot 43 provided in the coupling sleeve 39
as shown in Figure 4.

In order to prevent the vertical displacement of the wheels 23 from the tracks 29, horizontal guide strips 44 are secured to the lower horizontal flanges of the channel beams 18 to be arranged
5 directly above the treads of the wheels. Similar guide strips 45 are secured to the lower flanges of the channel beams 18 above the horizontal portion of the cam 30 whereby vertical displacement of the wheels 36 is likewise prevented during
10 movement of the carriage back and forth along the tracks.

The load carrying shank 41 depends a substantial distance below this overhead track and terminates in a hook 46 having a substantially horizontally disposed bill 47, over which the bales 48
15 of a container 49 are swung for supporting engagement therewith. The container 49 here illustrated is in the form of a circular perforated receptacle designed especially for the handling of a large number of canned goods, the combined
20 weight of which exceeds that which workmen can expeditiously handle.

These containers are conveyed up to the lift and transfer device by means of suitable trucks
25 50 preferably running on rails 51 up to the loading station of the air lift device. Here, the hook 46 is swung upon its pivot 35 and the bales 48 of the container are lapped over the same as shown in Figure 1. Thereupon, the valve control cable
30 15 is pulled by the workman to admit air under pressure into the right hand end of the cylinder 17 and to properly take care of the exhaust from the opposite end of the cylinder. The entrance of this medium into the cylinder causes the piston
35 rod 20 and associated carriage carrying the load supporting hook 46 to move toward the left of Figure 1. This movement causes the wheels 36 of the carriage to ride up the inclined plane 31 to elevate the container 49. During this movement
40 it will be noted that the bar 34 pivots upon the axle 22, while the perpendicular position of the hook is unaltered due to its pivotal suspension from the axle 35. Continued movement of the piston 19 to the left causes the wheels 36 to move
45 over the horizontal portion 30 of the cam and then down the inclined portion 32 of the track 29 to lower the container 49 onto the conveyor 52. The bales 48 are then released from the load suspension hook 46 to release the container and permit its movement by gravity down the conveyor
50 52 to a point of suitable discharge. Upon actuation of the other operating cable 15 of the valve mechanism 13, the valves are reversed to shift the carriage to the right of Figure 1 to retrace its movements and come to a stop on the horizontal portion 33 of the track in position to receive the next receptacle brought up by the truck 50. In such an arrangement, it will be evident that the load is not only moved vertically
60 by reason of the inclined planes 31 and 32 but is also caused to move horizontally to shift its load from the loading station to the discharge station above the gravity conveyor.

It will be noted that the hook 46 is open toward the delivery station and that the conveyor 52 is
65 arranged to give the receptacle 49 a direction of travel in continuation of the movement of the receptacle in approaching the receiving station. Thus, as the receptacle is lowered onto the conveyor and the tension on the bale elements 48 released, the latter tend to move out of the hook so that the receptacle continues along conveyor 52 under an initial impulse imparted upon its deposit thereon.

75 It is to be understood that various changes in

the construction and arrangement of parts may be resorted to without departing from the scope of the appended claims.

I claim:

1. A combined lift and transfer device comprising a track having a cam portion, a wheeled reciprocable carriage movable upon the track and including a member pivotally connected at one end, the other end of said member having anti-friction means adapted to ride over said cam portion, and a load carrier suspended from said member. 80
2. A combined lift and transfer device comprising a track having a cam portion, a wheeled reciprocable member movable along the track, a bar pivotally connected to said member and equipped with wheels operable upon said track, and a load carrier pivotally suspended from the wheeled portion of said bar. 85
3. A combined lift and transfer device comprising a track having a cam portion, a wheeled reciprocable carriage movable along the track and including a member pivotally connected at one end to said carriage, an axle mounted at the other end of said member, wheels on said axle adapted to ride over said cam portion, and a load carrier pivotally suspended from said axle. 90
4. A combined lift and transfer device comprising a track having a cam portion, a reciprocable rod having a forked end carrying an axle having wheels movable over said track, a bar pivotally connected at one end to said axle in the bifurcation of said reciprocable rod, an axle mounted in the other end of said bar, wheels mounted on said axle and movable over said track, and a load carrier having a bifurcated end pivotally connected to said last named axle between said wheels and bar. 95
5. A combined lift and transfer device comprising a track, a piston rod having wheels to run upon said track, a horizontal bar pivoted at one end to said rod, and having wheels at its other end to ride upon said track, a load carrier suspended from the wheeled end of said bar, and horizontal guide members above and in contact with the wheels of said rod to prevent vertical displacement thereof. 100
6. A combined lift and transfer device comprising a carriage, a horizontally extending trackway on which said carriage travels, said trackway having an upwardly offset portion, a fluid actuated piston articulated to said carriage for positively reciprocating it on said trackway, the carriage during its travel being guided to upper and lower positions by the trackway, and load supporting means depending from said carriage. 105
7. A combined lift and transfer device comprising a carriage, a horizontally extending trackway on which said carriage travels, said trackway having depressed end portions and an intermediate elevated portion, a fluid actuated piston articulated to said carriage for positively reciprocating it from end to end of said trackway, the carriage during its travel being guided to upper and lower positions by the trackway, and load supporting means depending from said carriage. 110
8. A combined lift and transfer device comprising a horizontally disposed cylinder and piston unit, a cross-head guiding the forward end of the piston against vertical distortions, a rod pivoted to the forward end of the piston, a horizontally extending trackway in advance of the piston, said trackway having an upwardly offset portion, means supporting the forward end of 115

said rod on said trackway to cause elevational displacements of the forward end of the rod upon its reciprocation by said piston, and load supporting means carried by said rod for vertical and horizontal displacement thereby.

9. A combined lift and transfer device comprising a horizontally disposed cylinder and piston unit, a cross-head guiding the forward end of the piston against vertical distortions, a rod pivoted to the forward end of the piston, a horizontally extending trackway in advance of the piston, said trackway having an upwardly offset portion, means supporting the forward end of said rod on said trackway to cause elevational displacements of the forward end of the rod upon its reciprocation by said piston, and load sup-

porting means suspended from the forward end of said rod.

10. Apparatus comprising a combined lift and transfer device, said device including a suspension hook movable between receiving and delivery stations in a horizontal path having an intermediate portion elevated relative to its end portions, said hook being open toward the delivery station, a receptacle having suspension means engageable over the hook, and a conveyor at the delivery station for receiving the receptacle and continuing the movement thereof in the same direction in which it approaches the delivery station.

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